# Algae

Factsheet (Secondary Learners)

## What are algae?

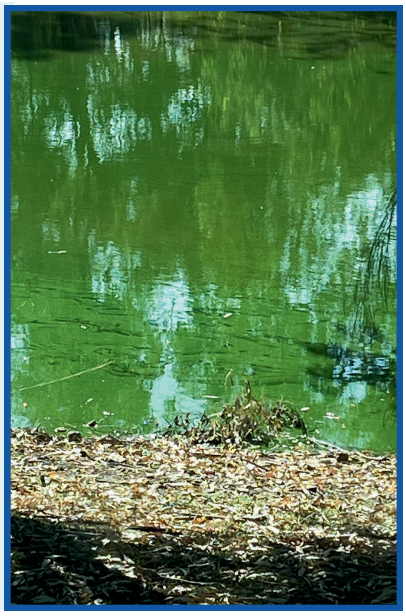
Algae are a group of photosynthetic organisms mainly found in water. They are an important part of ecosystems. They are the biggest producer on the planet, meaning they capture the sun's energy. They support nearly all other life in aquatic ecosystems.



## What types of algae are there?

There are many types of algae. They range in colour, species type and size (microscopic to macroscopic levels). In our waterways, we mostly find these types of algae:

- Green (Chlorophyta)
- Diatoms
- Blue-Green (Cyanobacteria)
- Dinoflagellates



DID YOU KNOW?

**Our scientists take samples of algae like the one in this picture and analyse them to see if they are harmful!**



## Why are algae important?

Algae are important for several reasons:

- They form the foundation of aquatic food chains. Many aquatic species rely on algae for food.
- They are photosynthetic organisms that release oxygen into the atmosphere. More than 50% of our global oxygen supply comes from microscopic algae.
- They absorb carbon dioxide. This regulates the global carbon cycle.
- They indicate water quality. The types and abundance of algae can inform scientists on the nutrient, pollution and salinity levels of waterways.
- They provide a habitat. Larger algae such as kelp and seaweeds create underwater shelter and breeding sites.

## What increases algae growth?

Algae are a natural part of healthy aquatic ecosystems. Their growth can increase when sunlight, warm temperatures and nutrients are abundant. Nutrients such as nitrogen and phosphorus (from leaf litter, bushfire ash, and fertilisers) fuel reproduction. Calm water conditions can allow algae to accumulate. Under these conditions, populations can grow quickly and form blooms that can affect water quality, recreation and ecosystem health.



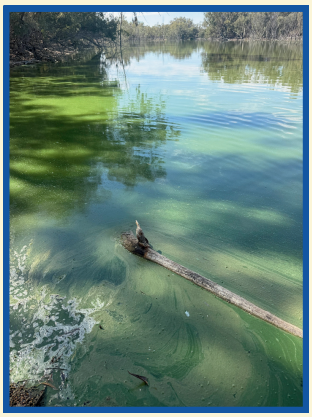
**Fertilisers are typically used on farms to increase productivity. However if they end up in waterways they can contribute to algal blooms.**

## Potential algae hazards



### Blue-Green Algae (Cyanobacteria)

Some blue-green algae are toxic. These blue-green algae are the only group of algae known to be toxic in freshwater. They can produce skin irritants and potent liver and neurotoxins. Sydney's warm summers and nutrient-rich catchments make our reservoirs susceptible to such blooms.



### Water treatment

High density algal blooms can clog filters and overload the steps in the treatment process and make the process less reliable. This can reduce a treatment plant's capacity to make enough clean water.



### Black water events

High densities of any phytoplankton, including algae, can cause black water events. The depletion of an ecosystem's oxygen has severe impacts through the entire food web.

## What are the negative impacts of algal blooms?

**In many cases algae and algal blooms are good for the environment.**

The negative impacts of some algal blooms are:

- Reducing sunlight penetration and limiting the growth of submerged plants
- Decreasing oxygen levels when large blooms die and decompose, potentially causing fish kills
- Altering the balance of an ecosystem by outcompeting with other aquatic organisms
- Producing toxins in the case of some blue-green algae, which can harm wildlife, livestock, pets and people.
- Affecting water quality, creating unpleasant tastes and odours and impacting recreational uses

## What is WaterNSW's role in monitoring the water for algae?

WaterNSW is responsible for testing for, and notifying about, blue-green algal blooms in the river systems and storages that we manage. Some methods of algae detection used are:

- Weekly to monthly physical water sampling at high to low-risk NSW sites. (A phycologist looks at the samples.)
- Satellite imagery oversights every 2 to 3 days. Scientists look for high levels of chlorophyll-a in the images as they signifying an algal outbreak.
- Public and stakeholder reporting of algae to WaterNSW

## How does WaterNSW communicate with the public about algae?

As there are many water users in NSW that can be affected by algal blooms, WaterNSW maintains statewide algal alerts and procedures. These include:

- Coordinating algal monitoring and public information
- Working with agencies to manage algal bloom risks
- Connecting regional stakeholders with the State Algal Advisory Group (SAAG)
- Identifying knowledge gaps and supporting research
- Keeping water users and stakeholders informed with regular algal updates