

**Using the Words
'Good', 'Healthy', 'Clean'
for describing our
waterbodies:
A How-to Guide**



AlgaEnviro





AlgaEnviro

- Company started in 2015
- 25 years working with microalgae/water
- Supply to councils, utilities, aquaculture, farmers, gardeners
- Treating raw water, wastewater, stormwater, fish and prawn ponds etc.
- Supply throughout Australia, New Zealand, USA and Philippines



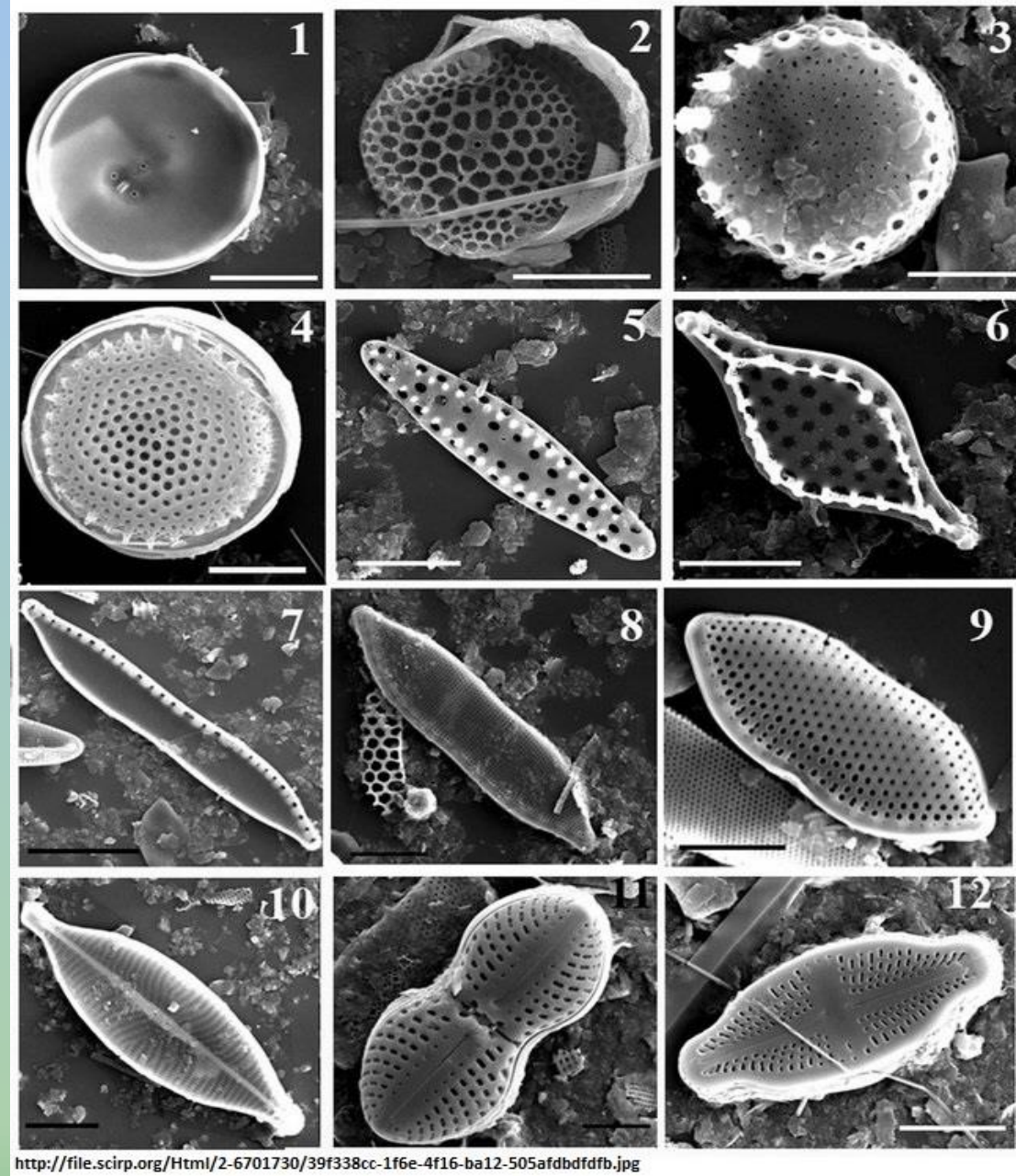
What is Diatomix?

- A liquid formulation of micronutrients that are added to the water to correct the imbalance of too much nitrogen and phosphorus in the water.
- SiLution is a silica supplement that is added to the water to increase reactive silica levels. Silica is an essential ingredient for diatom algae.



What are diatoms?

Diatoms are a diverse group of algae, one of the most common types of organism found in soils, oceans, lakes and freshwater ecosystems.



Why target diatoms?

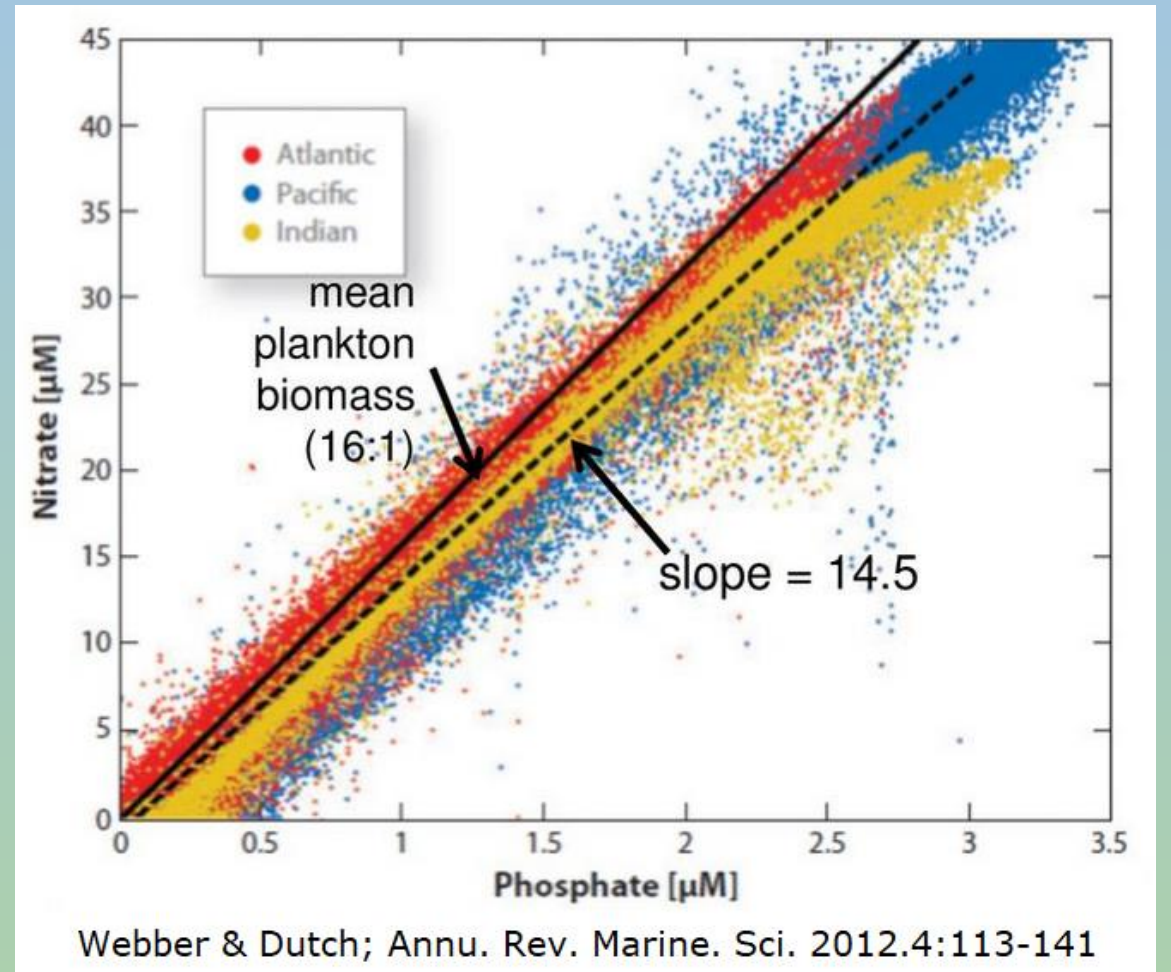
Diatoms are a microscopic algae that make up a large proportion of the first step in the food chain for higher trophic levels e.g. zooplankton, insects, snails, fish, birds.



It is all about the correct balance

There is a ratio between nitrogen, phosphorus, iron and other nutrients in water and in living organisms.

The Redfield ratio is approximately:
N:P:Fe = 16,000 : 1,000 : 1



It is all about the correct balance

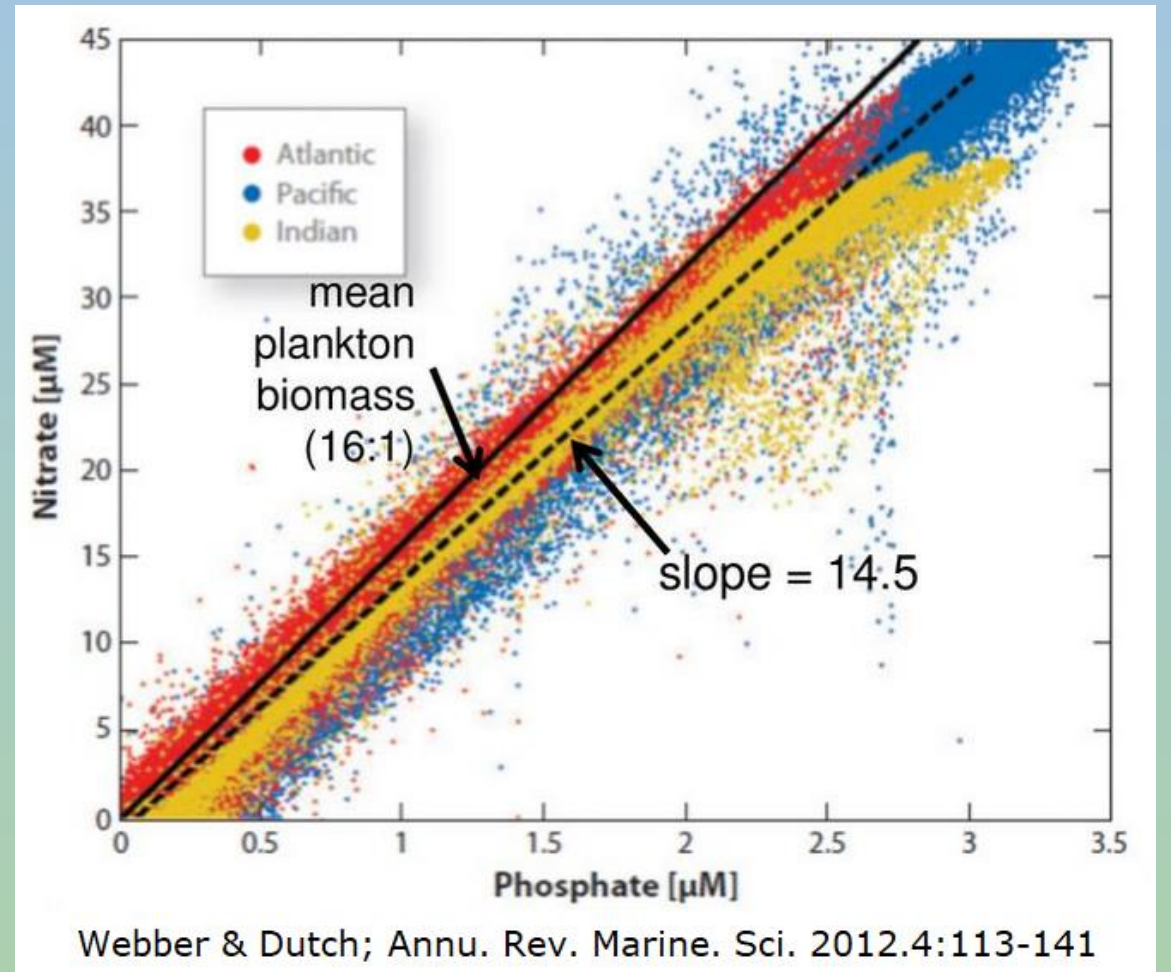
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In a Polluted/Eutrophic waterbody:

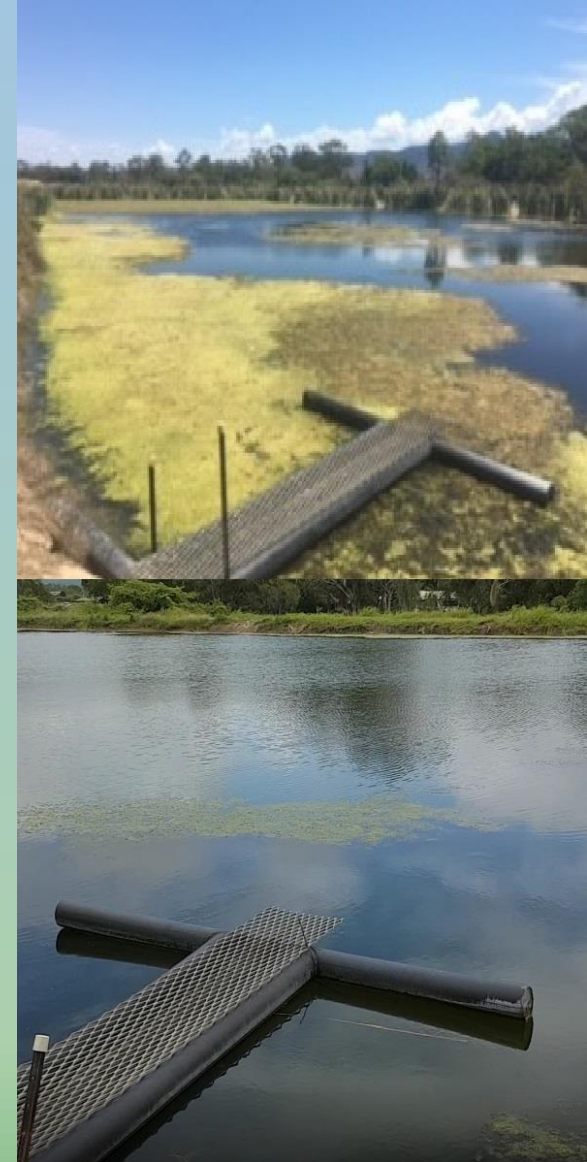
$N:P:Fe = 16,000,000 : 1,000,000 : 1$



Targeted Micronutrient Addition

Diatomix™ is a liquid that contains silica compounds embedded with ten micronutrients that are only bio-available to the naturally occurring diatom algae in the waterbody.

- Iron
- Manganese
- Cobalt
- Molybdenum
- Calcium
- Boron
- Copper
- Magnesium
- Zinc
- Potassium



Reducing Nutrients in Aquaculture



Before

After

Stopping Weeds and Blue Dye



Day 0



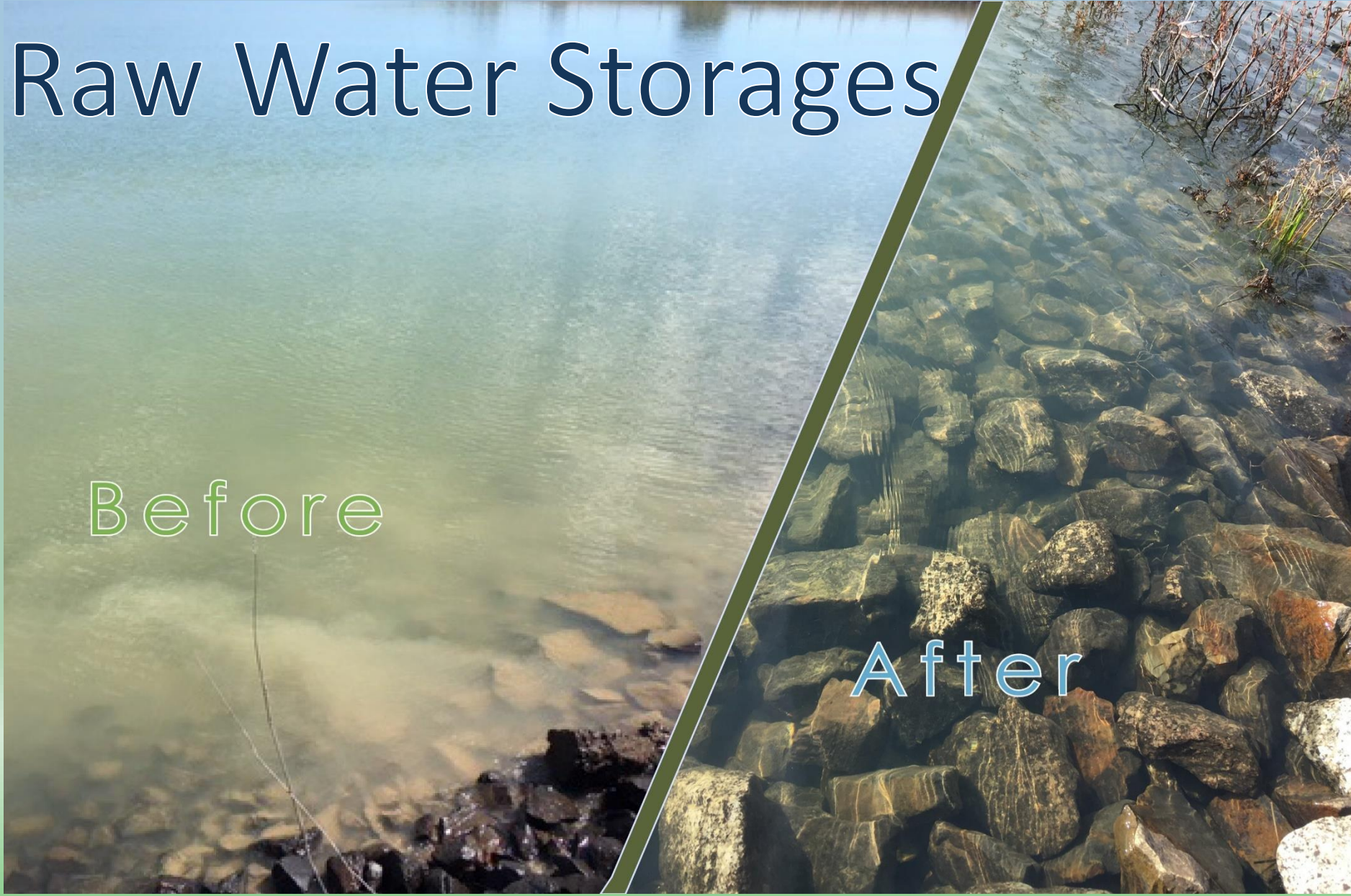
Day 35

Eliminate Blue-Green Algae Blooms

Raw Water Storages

Before

After



Eliminate Blue-Green Algae Blooms

Gippsland
15th September, 2023



Treated with Diatomix IV
plus SiLution™
27th October, 2023



Cost-Effective, Sustainable Control



Eliminate Blue-Green Algae Blooms

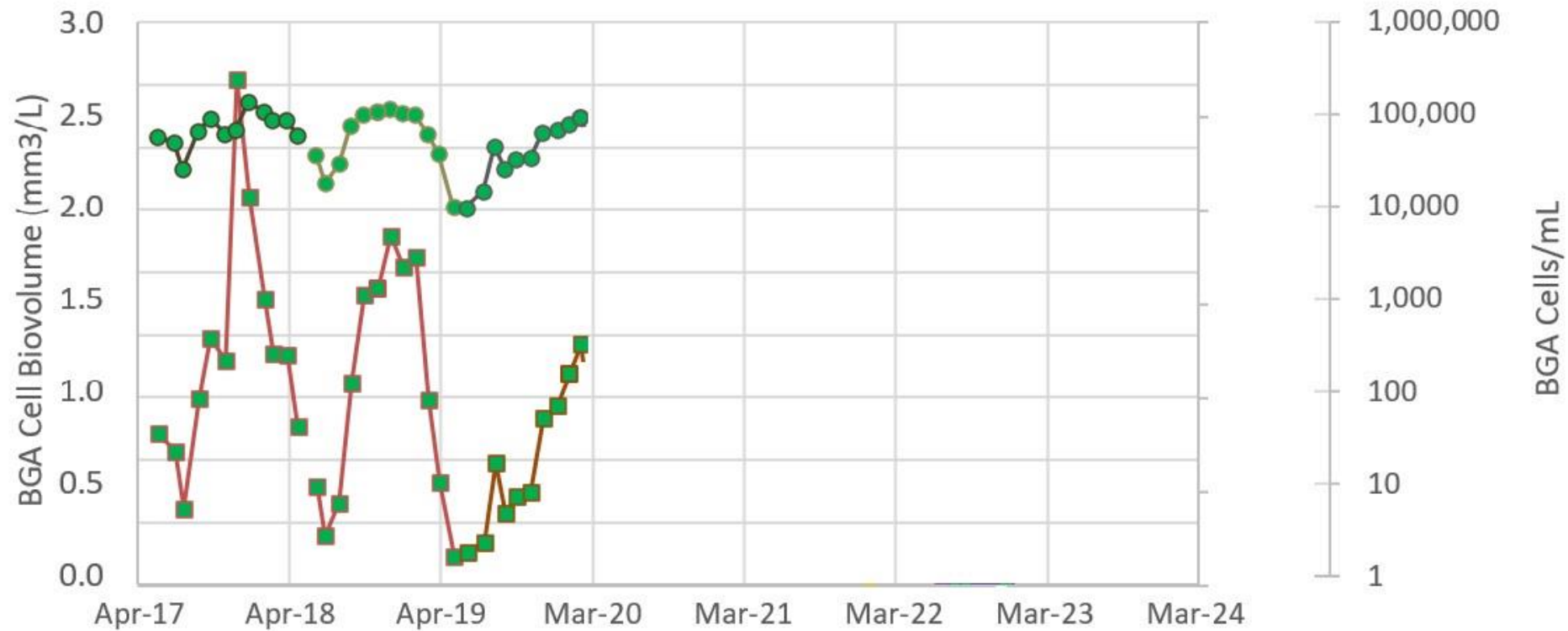
Wastewater Treatment

Before



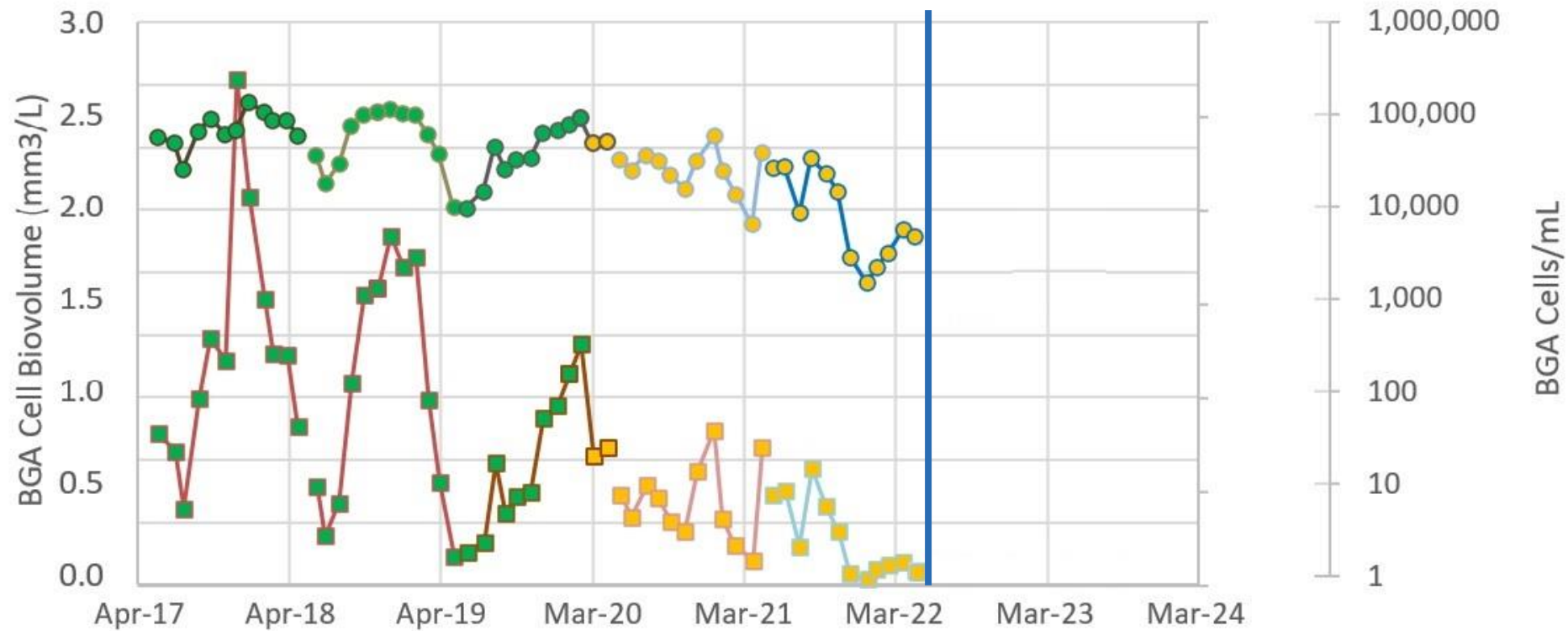
After

Raw Water Dam – 40 Hectares



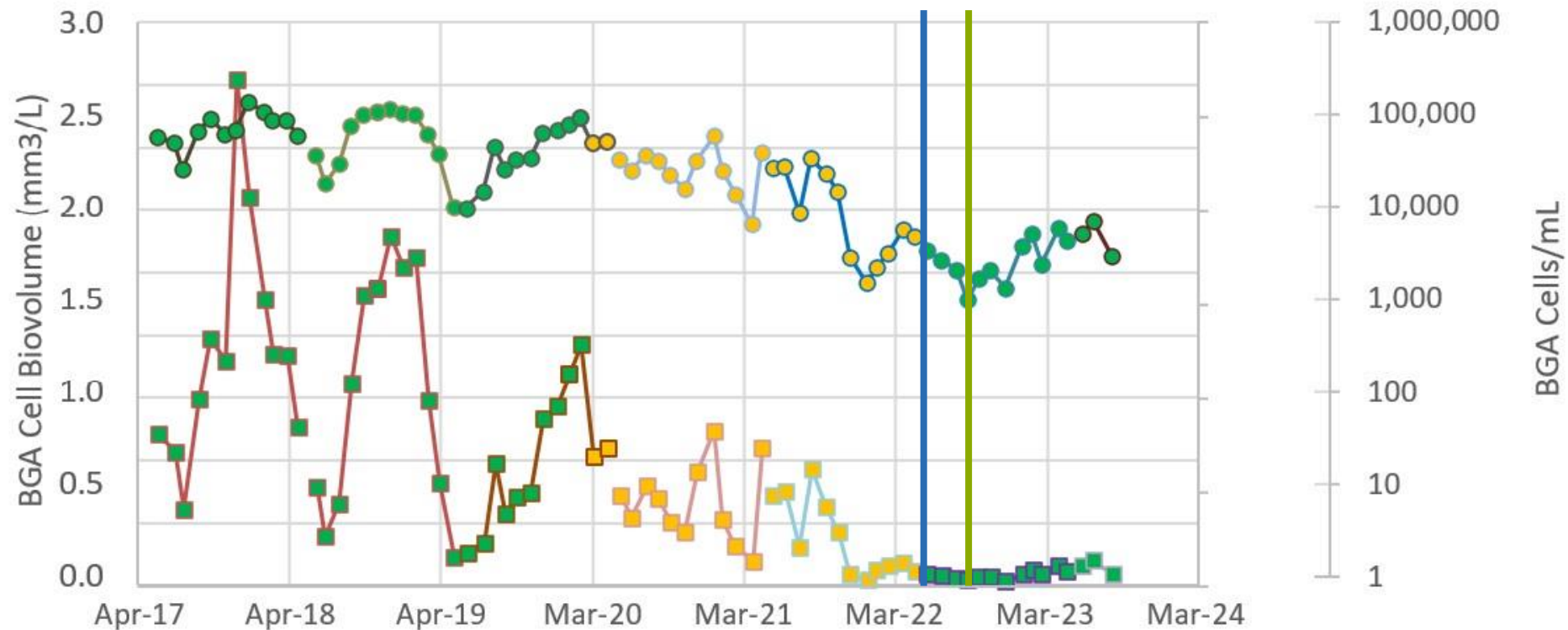
■ BioV - 2017 ■ BioV - 2018 ■ BioV - 2019
● BGA - 2017 ● BGA - 2018 ● BGA - 2019

Raw Water Dam – 40 Hectares



■ BioV - 2017 ■ BioV - 2018 ■ BioV - 2019 ■ BioV - 2020 ■ BioV - 2021
● BGA - 2017 ● BGA - 2018 ● BGA - 2019 ● BGA - 2020 ● BGA - 2021

Raw Water Dam – 40 Hectares



■ BioV - 2017 ■ BioV - 2018 ■ BioV - 2019 ■ BioV - 2020 ■ BioV - 2021 ■ BioV - 2022 ■ BioV - 2023
● BGA - 2017 ● BGA - 2018 ● BGA - 2019 ● BGA - 2020 ● BGA - 2021 ● BGA - 2022 ● BGA - 2023

Raw Water Dam – 40 Hectares

	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	Blue-green Algae (cells/mL)	BGA Bio-Volume (mm ³ /L)
Pre-Treatment Average	0.54	0.029	65,217	1.493
Treatment Average	0.30	0.016	3,435	0.123
Post-Treatment Average	0.44	0.031	5,562	0.152
Pre vs. Txt % change	44 ↓	45 ↓	95 ↓	92 ↓
Txt vs. Post % change	47 ↑	89 ↑	62 ↑	24 ↑

Diatomix™

Case Study 2

Treatment of a Wetland

Wastewater Effluent

Before dosing started



Diatomix™

Case Study 2

Treatment of a Wetland

Wastewater Effluent

Before dosing started



Diatomix™

Case Study 2

Treatment of a Wetland

Wastewater Effluent

100 days after dosing





Untreated wetland - ↓ water clarity, ↑ suspended algae, ↓ biodiversity



Diatomix treated wetland - ↓ suspended algae, ↑ biodiversity, ↑ dissolved oxygen



AlgaEnviro

www.algaenviro.com.au

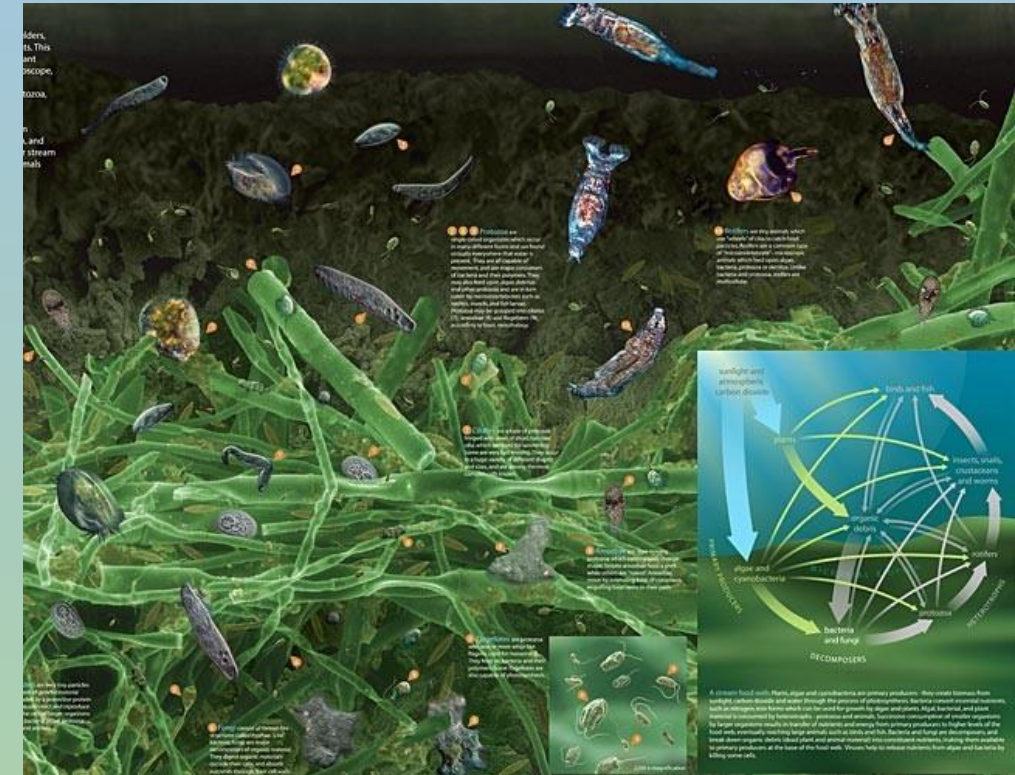
Before treatment with Diatomix IV and SiLution



With dosing of Diatomix IV and SiLution

Biofilm Habitats

- Diatoms are commonly found in biofilms, rather than as suspended 'phytoplankton.'
- If there are not many places for a biofilm to form, where sunlight can reach, diatom growth and the treatment process may not be as effective.
- There needs to be a way of getting more surface area, more suitable habitat, into the light zone.



Biofilm Floating Habitat (BFH)

- The introduction of an artificial habitat, where diatoms can live and replicate.
- The BFH also provides an ecosystem for the micro- and macro-invertebrates to live and reproduce, enhancing the food web.



Biofilm Floating Habitat (BFH)

- Diatoms, converting ammonia, nitrate and phosphate into food for animals, creates an entire treatment food web system that allows for nutrient export.
- The BFH creates the near surface habitat for diatoms to live, in turn creating the food all the way up the food web to turtles, fish and birds.



Latest Moments of Excitement

- Australian Bass – DPIE grow many species of endangered native fish, for restocking waterways.
- They do not receive pellet feeds, so they will learn how to hunt in the wild.
- Their food is from primary productivity in the ponds.
- In a first trial with Diatomix IV, and silica supplement, the fish were 20% longer at the end of the trial, compared to control fish.



Latest Moments of Excitement

- The Olive Perchlet – A threatened species. Limited success with breeding this fish in captivity.
- In one 5,000 L tank of Perchlets at the end of December, Diatomix was regularly added.
- Eight weeks later they noticed there were several cohorts of fish from different spawnings.
- When it comes to breeding, we all need a good feed.



Department of
Primary Industries

primefact

Olive Perchlet (western population) - *Ambassis agassizii*

November 2013 Primefact 176 Second edition
Fisheries Ecosystems Unit, Port Stephens Fisheries Institute

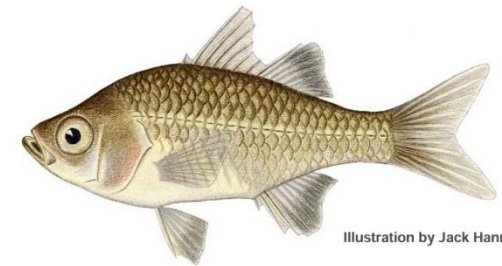


Illustration by Jack Hannan

Introduction

Olive Perchlet, also known as Agassiz's Glassfish, are a small native fish that occur in both eastern (coastal) and western (Murray-Darling) drainages in NSW, but these populations may be genetically distinct.

The western population of Olive Perchlet were once widespread throughout the Murray-Darling system of South Australia, Victoria, western New South Wales and southern Queensland, but have suffered serious decline. The population is now found in limited sites in the Darling River drainage and an isolated population in the central Lachlan catchment. The species is extinct in Victoria and has not been found in South Australia since 1983.

The western population of Olive Perchlet is listed as an **endangered population** in NSW. There are heavy penalties for harming, possessing, buying or selling them, or for harming their habitat (see 'Legal implications').

Description

Olive Perchlet have an oval shaped body with a moderately large mouth, very large eyes and a

forked tail. They are usually semi-transparent, with dark-edged scales forming a distinct pattern. The fins are generally clear, although there is often a broad, blackish band along the edges of the pelvic and anal fins. Olive Perchlet can grow to about 70-80 mm but are more commonly less than 40 mm.

Habitat and ecology

- Olive Perchlet inhabit rivers, creeks, ponds and swamps. They are usually found in slow-flowing or still waters.
- They are usually found in sheltered areas such as overhanging vegetation, aquatic macrophyte beds, logs, dead branches and boulders during the day, and disperse to feed during the night.
- Males and females reach sexual maturity at one year of age, and live for 2-4 years. Spawning occurs from October to December, when water temperatures increase to approximately 23°C. Females lay 200-700 eggs which attach to aquatic plants and rocks on the streambed.
- Olive Perchlet feed on a range of zooplankton and aquatic and terrestrial insects.

Site Data Required by AlgaEnviro

For AlgaEnviro to determine a dosage regimen for a site, the following information is required:

- Ammonia as N (mg/L)
- Nitrate as N (mg/L)
- Orthophosphate (mg/L)
- Reactive Silica (mg/L) (not essential but strongly recommended)
- Surface area of waterbody (m² or Ha)
- Inflow to waterbody (kL/day)
- Nutrient profile (as above) for influent flow
- Historical data for Algae and nutrients is useful but not essential

Questions



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More information can be found on our website:

www.algaenviro.com.au