

May 2012 in our Catchment

It was dry for a while there. We had less than a millimetre on Friday morning (18th) and before that... Most of the waterways have continued to flow quite well, but will that continue? A cold, dry winter would be rather hard on our waterways. Of course, after the 24th and 25th things have changed, but most of you had sampled by then.

Your Results

There were numerous places where the Electrical Conductivity was elevated...frequently a sign of lowering of flow or dropping of the water table. In rural areas the mineral content is closely associated with the local geology and hydrology. In urban areas hard surfaces and human intervention have considerable impacts. Percent saturation of dissolved Oxygen was poor in Lake Burley Griffin...blooms both produce and consume large amounts of oxygen...and in the bottom of Sullivans Ck (along with elevated phosphate levels). The spike in nitrates in Barracks Creek may be linked to the Edwin Land Parkway road works, but I have no confirmation of this at present.

The lingering(?) *Microcystis* algal bloom in Lake Burley Griffin is both unseasonal and unpleasant. Other algal observations have been more in line with expectations: the algal fringe along the Molonglo after it meets the Queanbeyan is probably seasonal; the beds of stoneworts on the floors of the Watson Wetlands bodes well for water conditions ; and the rose madder fuzz on the aquatics in the upper Molonglo indicates good water quality.

When you are doing your calibrations, don't use more than you need to do the job. A capful or 15 ml is usually plenty. You need only do the calibration once for a sampling day, not each time you use the instrument. That way you will not run out before the next QA/QC.

The algae in the creek

Sometimes this is an exacting job with very few rewards: last week I had to go on a 3km hike down Burra Creek on a fine and sunny autumn morning!

For much of the way, the rocks and cobbles in the creek had a fine brown cover of diatoms. In a few places the diatom custard had risen to the surface as cellular multiplication and photosynthesis exploited the mild weather and the absence of rain-induced flushing. There were also a couple of pools of silkweed rafts.



Diatoms are tiny photosynthetic organisms that live in glass cases. Like their relatives the wracks, the tangles and the kelps, they have several yellow or orange light-trapping pigments along with their chlorophyll, so they look brown. On this occasion the common ones were two shaped like Napoleon's hat, called

Cymbella, and one like a violin case called *Gomphonema*. All three are probably common up here but I don't know of any lists of upper Murrumbidgee diatoms.

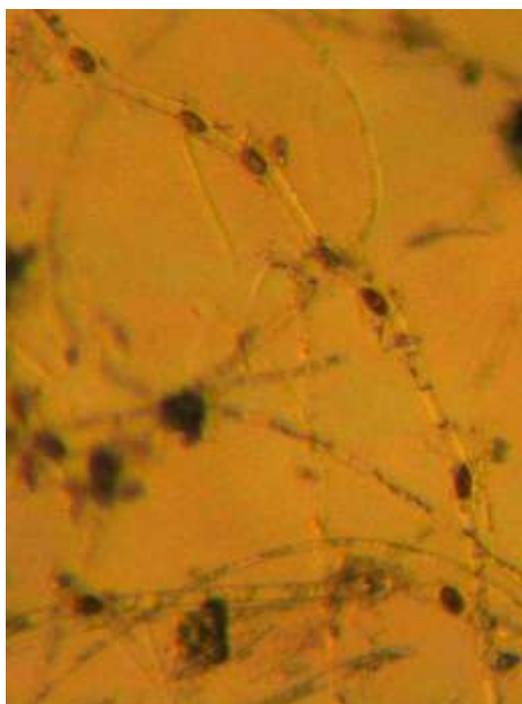


The Silkweeds (the Zygnemales) are very much the grasses of the waterways. There are many and varied species. Some grow in shade, some in sun, some in still water, some in rapids, some like glacier lakes, some bask in the coastal tropics, and some even like wet sandy soil.

These algae – or proto-plants, as they are more closely related to land plants than green seaweeds – are filaments with clear, cellulose walls, a single prominent, star-like nucleus per cell, and conspicuous chloroplasts. *Spirogyra* has chloroplast springs; *Mougeotia* has ribbons; *Zygnema* has stars. Their

reproduction is very different – they fuse the contents of two vegetative cells to form a single zygospore, hard shelled, tough and long lasting! They are seasonal, and respond to the condition of their waterway.

They can be useful indicators of waterway condition. They grow rapidly to make the most of favourable conditions. They reproduce. They die back. [sound like a grass?] In tropical areas they may be the main aquatic vegetation in certain systems. Down here they are distinctly seasonal.



The Burra Creek flora had three species of *Spirogyra*, two of *Mougeotia* and one of *Zygnema* showing up in those rafts on Tuesday. One *Spirogyra* and one *Mougeotia* were reproductive. *Spirogyra chenii* is distinctive. It has paired footballs as zygospores in its reproductive filaments, and the remainder of the 18–24 µm wide cells have plain end-walls and one spiral of chloroplast. The *Mougeotia* species has rectangular faced zygospores and fine filaments, about 12 µm wide, with the ribbon chloroplast in each cell having six starch granules. It's common in Australia, and similar to *M. quadrangulata*, but it may be yet to be described.

Why does any of this matter? The presence of both the floating masses of diatoms and the seasonal flushes of silkweeds tells us that Burra Creek is in fine condition, but could be even better. The diatom custard indicates that the water has been rich in nutrients (probably from the recent flood) and that flow is a bit sluggish following that flood. The flow is enough to have the water moving noisily through the riffles while allowing the diatoms to multiply in the pools with only minor consumption by caddis larvae, water

boatmen and other biofilm (periphyton) feeders. The silkweeds indicate that the canopy of the creek-bank vegetation is open and woodland-like, rather than closed by wattles and teatree. This would be a problem if the vegetation was receding as in a drought or under poor management. Going by the numerous and healthy seedling gums and wattles that is not the case in Burra Ck.

Calendar

Tuesday 5 th June	Platypus Awareness & Conservation Strategy	Queanbeyan Council Chambers, 6:00–7:30 pm
Weekend, 16 th & 17 th June	MCG Waterwatch Sampling time	Your sites
Saturday 16 th June	Water Rat and Platypus Walk	Riverside Cemetery. Meet at end of Erin St Queanbeyan, 3:00 pm
Tuesday 10 th July	Frogwatch Refresher Course	Evening. Times and location to be announced.

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ⁱThe operation of the Molonglo Catchment Group and Waterwatch program is assisted by the Australian Government's Caring for our Country and the ACT Government. Some administrative assistance is provided by the Australian Government's GVESHO program.