

Didymo in Otago

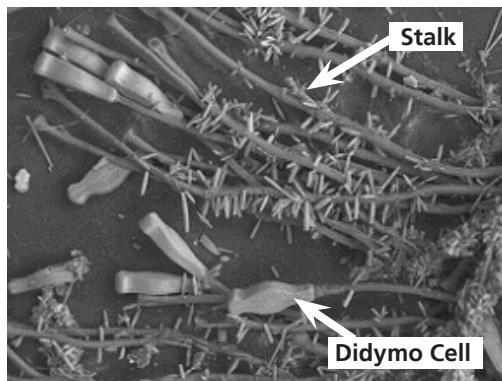
Surface water quality fact sheet

2008

Key points

- Didymo is now present in 23 rivers and lakes in Otago.
- Distribution is restricted to the Clutha and Kakanui catchments.
- Flow variation is the most important factor in limiting the build-up of thick mats of Didymo.
- Didymo can have significant impacts on the aesthetic and recreational values of Otago's waterways and can also cause clogging of irrigation equipment.
- Didymo management in Otago is now being co-ordinated by the Otago Regional Council (ORC) with support from partner organisations such as Fish and Game, Department of Conservation, recreational groups, power companies and irrigators.
- Any new suspected Didymo sighting should be reported to the ORC on 0800 474 082.

Didymo (*Didymosphenia geminata*) is a freshwater diatom (a type of algae) native to the Northern Hemisphere. Didymo is known as a stalked diatom, with cells growing on the end of long stalks. These stalks create the thick brown mats that give Didymo the nickname "rock snot". Despite its slimy appearance, Didymo mats are gritty to touch and feel similar to cotton wool. There are several native algae (*Gomphonema* and *Gomphoneis*) that look superficially similar to Didymo, but can be distinguished by their slimy feel. Unlike Didymo, mats of these native species will break apart when squeezed firmly between thumb and forefinger.



Above: Scanning electron micrograph of Didymo cells and stalks, with smaller native diatoms attached to Didymo stalks (Prof. M. Gretz, Michigan Tech)



Above: When Didymo is squeezed between thumb and forefinger, it has the appearance and feel of cotton wool

The extremely fast growth rate of Didymo, and its ability to reproduce by simply splitting its cells in half, allows Didymo to achieve the rapid accumulation of biomass observed in many rivers throughout the region.

Below: Thick Didymo mats in the Hawea River



Didymo was first discovered in New Zealand in Southland in October 2004. The first Didymo incursion in Otago occurred in the Hawea River (Central Otago) in September 2005 and it has now spread throughout most of the Clutha catchment as well as the lower Kakanui River in North Otago (over page).

Didymo samples database

<https://www.didyosamplesdb.org.nz>

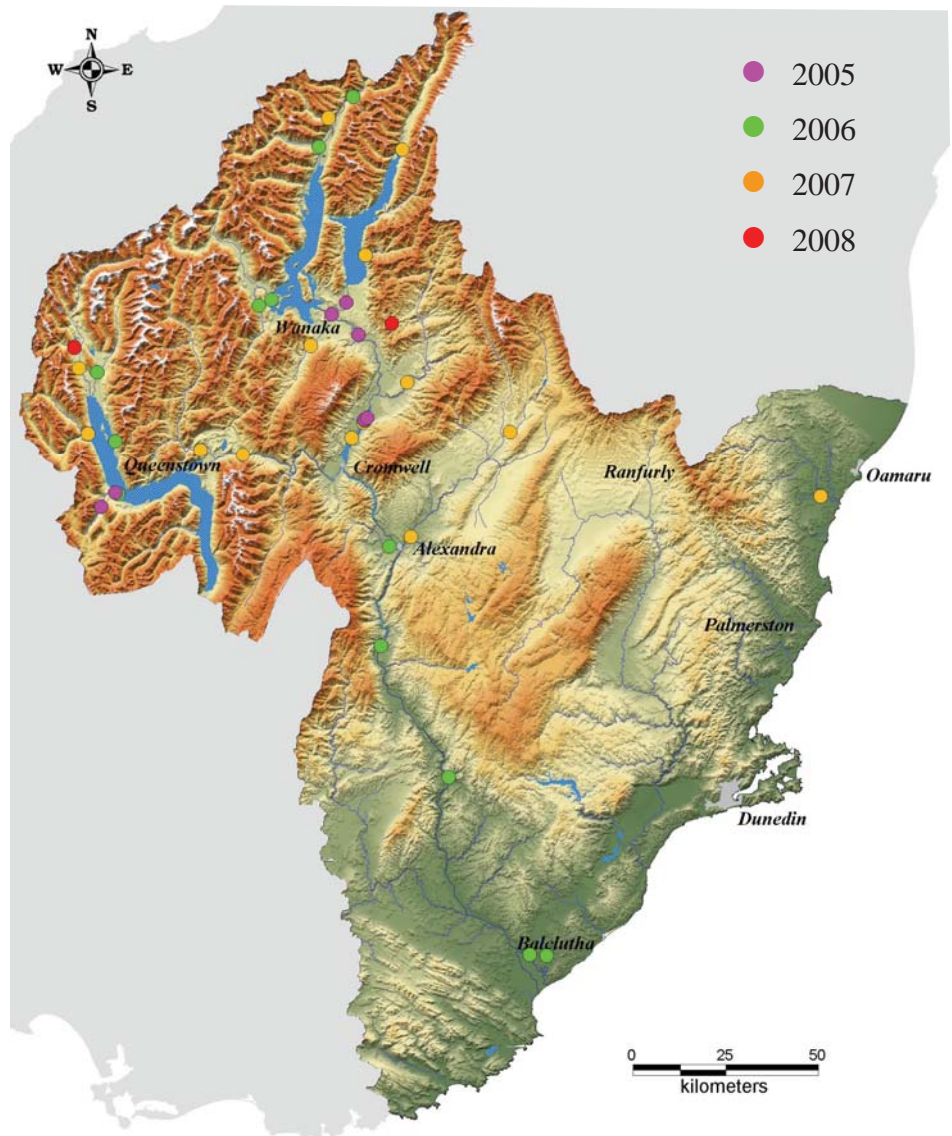
- The Didymo samples database is a comprehensive online record of Didymo monitoring in New Zealand.
- Allows for the creation of maps of infected, uninfected and suspect sites.
- Allows for region-specific searches.
- Access is now publicly available.

Username: Didymo

Password: didyosamples1

- For any questions regarding the Didymo Samples Database, contact MAF at didymo@maf.govt.nz

Below: Map of Otago showing sites infected with Didymo



Impacts of Didymo

Didymo infestations have a negative impact on the aesthetic values of Otago's rivers, as well as impacting on recreational fishing by fouling hooks and equipment. Didymo has also caused significant problems in irrigation schemes by clogging intake screens, sprinkler nozzles and filters.

Didymo poses a potential threat to the largest population of the nationally threatened lowland longjaw galaxias (*Galaxias cobitinis*) in the Kauru and Kakanui Rivers in North Otago. Didymo has the potential to smother the habitat used by the longjaw galaxias as well as reducing the availability of its preferred food (mayflies). The spread of Didymo in the Kakanui catchment is being closely monitored by the Department of Conservation and research is currently being undertaken to assess the impacts of Didymo on the lowland longjaw galaxias.



Above: The lowland longjaw galaxias, New Zealand's most threatened fish species (photo courtesy of R.M. McDowall, NIWA)

Didymosphenia geminata (Didymo) in Otago

Recent research has indicated that *Didymo* may change invertebrate populations in infected rivers, with greater proportions of taxa such as midges and worms and lower proportions of mayflies and stoneflies, although overall abundance of all invertebrates is greater.

Didymo in lakes

Didymo has been observed growing along the edges of several lakes in Otago including Wakatipu, Wanaka and Dunstan. Indications are that *Didymo* in lakes may be limited to areas of high wave action and/or some degree of flow.

Below: *Didymo* growing on rocks in the wash zone in Queenstown Bay, Lake Wakatipu

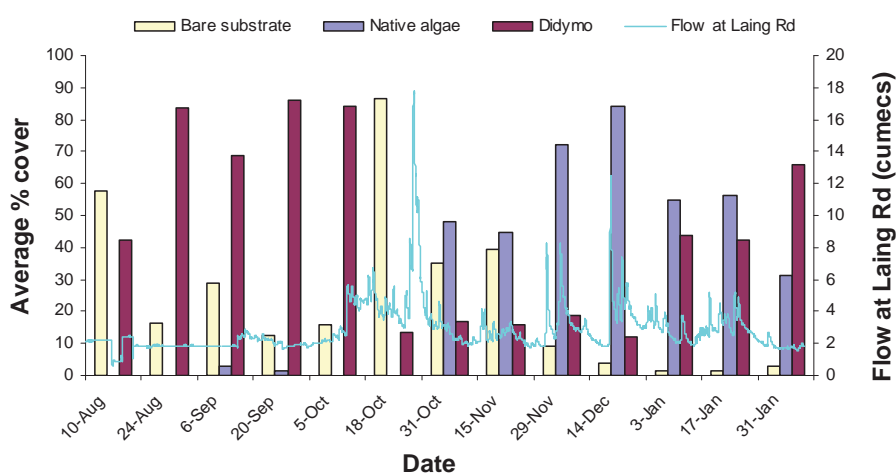


Effects of high flow variation, channel shape and substrate size on *Didymo* growth

The severity of *Didymo* blooms is largely controlled by variation in the speed of water next to the river bed, which is influenced by substrate size, flow variation and channel shape.

A study undertaken by ORC in the Fraser River showed that *Didymo* cover was high when flows were low and stable, but when flows increased, most of the biomass was removed and replaced by native algae. Once flows became more stable towards the end of the monitoring study, *Didymo* cover began to increase again.

Below: Percentage cover of *Didymo* in the Fraser River at Marshall Rd, showing the effect of flow variation on *Didymo* cover



Large *Didymo* blooms have been observed in the Hawea, Clutha River/Mata-Au, Waitaki, Waiau and Mararoa Rivers which all have long periods of stable flow. Rivers with more variable flow regimes such as the Von, Matukituki, Motatapu, Makarora and Wilkin have not experienced these blooms due to large increases in velocities during high flow periods.

Slowing the spread of *Didymo*

- Ensure all equipment that has come into contact with water is decontaminated before moving between catchments or upstream within the same catchment.
- Decontamination kits

A simple cleaning kit that can be easily stored in a vehicle is made up of:

- o Cleaning procedures sheet, available from the Biosecurity New Zealand web page.
- o 30L bucket with sealable lid
- o Cleaning agent (e.g. Bleach or detergent)
- o Disposable plastic bags
- o Scrubbing brush
- o Spray bottle

CHECK, CLEAN, DRY

CHECK

- Before you leave a river or lake, check items and leave any debris at the site. If you find any later, treat and put in rubbish. DO NOT wash down drains

CLEAN

- Non-absorbent items
 - o Detergent: soak or spray all surfaces for at least one minute in 5% dishwashing detergent or nappy cleaner
 - o Bleach: soak or spray all surfaces for at least one minute in 2% household bleach
 - o Hot water: soak for at least one minute in very hot water kept above 60 °C (too hot to touch)
- Absorbent items require much longer soaking times to allow thorough saturation
 - o Freezing any item until solid will also kill *Didymo*

DRY

- Drying will kill *Didymo*, but slightly moist *Didymo* can survive for months. Ensure items are completely dry to the touch, inside and out, then left dry for at least another 48 hours before use

Controlling Didymo

There's currently no tool available to effectively eradicate Didymo in a natural river; however, there are several management options available to control Didymo blooms or mitigate their effects.

Irrigation systems

Didymo can affect irrigation systems in several ways; from clogging intake screens and sprinkler nozzles to the choking of races.

- **Settling ponds:** Installing settling ponds at key points in the irrigation system will allow Didymo to settle out of the water column and prevent it moving further down the system.
- **Drying:** Didymo is not able to survive long periods of drying. Allowing race systems to dry for several days will prevent build-up of thick Didymo mats.
- **Flushing flows:** Flushing out irrigation races with a pulse of high flow will remove large Didymo mats from the system.
- **Chemical control:** Studies undertaken for Biosecurity New Zealand have shown that a chelated copper substance known as Gemex™ can greatly reduce Didymo biomass in small waterways.
- **Screening:** Many irrigators use self-cleaning screens that prevent clumps of Didymo entering the system.

Lakes

Didymo hasn't been observed growing to high biomass in lakes and Didymo doesn't seem to cause significant problems in lakes other than impacting aesthetic values.

Rivers

There are few management options available to control Didymo in rivers. Flushing flows may reduce build-up of large Didymo blooms; however, this only applies to rivers that are artificially controlled by dams. Chemical control can temporarily reduce Didymo biomass in small streams; however, chemical treatment has only a short-term effect and is expensive. For most rivers, Didymo is here to stay for the foreseeable future.

Frequently asked questions

Does Didymo affect human or animal health?

- There have been no recorded human or animal health problems caused by Didymo other than slight eye irritation experienced by some swimmers in areas with severe Didymo blooms.

Does Didymo affect trout or other fish?

- It's unclear if Didymo has any direct impact on fish. However, it's possible that changes in invertebrate populations may affect the food source of many native fish (including the longjaw galaxias) as well as trout.

When can I get more information about Didymo?

- Further information is available from the Biosecurity New Zealand web site: <http://www.biosecurity.govt.nz/pests-diseases/plants/didymo/>
- A full report on Didymo in Otago is available from the Otago Regional Council web site: <http://www.orc.govt.nz>
- Alternatively, you can contact ORC on 0800 474 082.

Contact

Otago Regional Council
Ph: 0800 474 082

www.orc.govt.nz

