IRELAND'S environment

River & Lake Monitoring - Phytobenthos

epa Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

Did you know?

Phytobenthos is the name given to the tiny organisms commonly found on stones in the bottom of rivers and lakes. Many of the organisms, like bacteria and algae, live in thin layers on the surface of stones, this is called the bio-film and gives the stones their characteristic slippery feel.

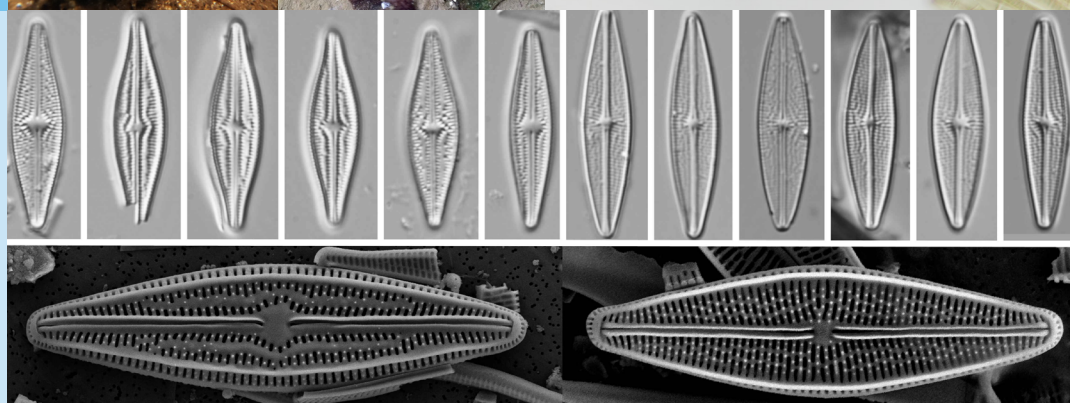
Phytobenthos is an important part of the aquatic food chain providing nourishment for insects which in turn provide food for fish and birds. When nutrient levels in the water are too high, however, some types of phytobenthos grow too much and can form scums and blooms which can harm other aquatic life and badly affect water quality.

Different types of phytobenthos

Cyanobacteria, also known as blue-green algae, are sometimes found in the phytobenthos. Some forms of cyanobacteria can produce chemicals called toxins that are harmful to people and animals when they form blooms and algal scums in summer. Because of this, all algal scums if encountered should be avoided by people and pets alike.

Cyanobacterial mats are naturally occurring and consist of countless microscopic filaments.

Diatoms are microscopic organisms that are very abundant in the phytobenthos. They have complex designs and individual species can be identified with a microscope based on their shape and pattern.



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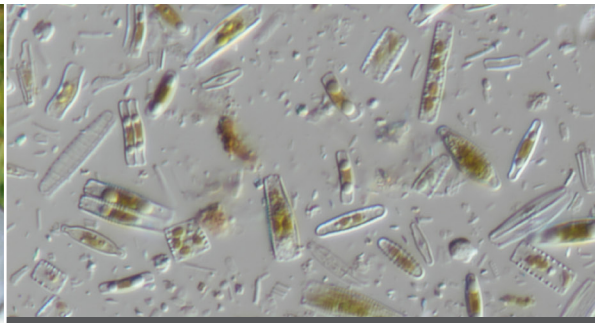
How do we monitor phytobenthos?

Samples of diatoms are collected by brushing the surface of stones from the river or lake to remove the biofilm. The samples are cleaned in the laboratory to show the distinctive features of the diatoms making them easier to identify and count with a microscope.

(a) A diatom biofilm is visible as brown patches on this rock



(b) The individual diatoms can be seen with a microscope

(c) The different types of diatoms can be seen after cleaning

How are the results used to assess water quality?

Diatoms have been studied for a long time, so we know what kind of water quality certain species like and dislike. These are called indicator species. The EPA uses changes in the type and number of diatom indicator species in the phytobenthos to assess water quality.

Each indicator species is given a score that ranges from 1 to 5 depending on its sensitivity or tolerance to pollution. The final score is calculated after several hundred of the most common diatoms in a sample are identified by a biologist. The score is used to assess the level of pollution in the water and allows us to assign the river or lake to one of five water quality classes.

1. High	**2.** Good	**3.** Moderate	**4.** Poor	**5.** Bad

'High' is when the water is not polluted at all, and 'bad' is when the water is most polluted.

For the latest information go to **www.epa.ie/irelandsenvironment**
The river and lake monitoring fact sheets can be found at
http://www.epa.ie/irelandsenvironment/getinformed/infographics/

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