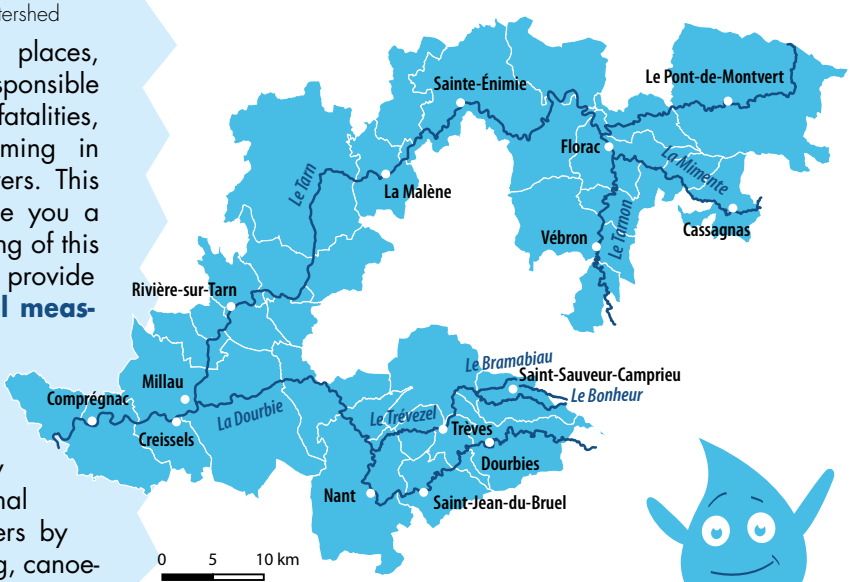
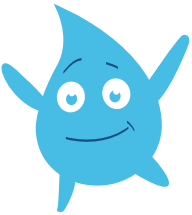
CYANOBACTERIA IN OUR RIVERS: FACT OR FICTION?

SERGE VÉDRINES
Chairman of the Joint Syndicate of the Tarn-amont watershed

"Like in other places, cyanobacteria, responsible for recent dog fatalities, are naturally forming in the Tarn-amont rivers. This document will give you a better understanding of this phenomenon and provide you with **practical measures** to minimize any risks. So you can take full advantage of the stunning scenery and the exceptional quality of our rivers by enjoying swimming, canoeing...".

THE AREA MONITORED FOR RISKS RELATED TO CYANOBACTERIA





CYANOBACTERIA ARE AMONG THE OLDEST ORGANISMS ON EARTH (3.8 BILLION YEARS)

They likely played a role in creating the ozone layer, which facilitated the diversification of life on Earth.
Their adaptability plays a crucial role in ecosystems, though they can sometimes pose health risks. From 2002 to 2023, there were 37 recorded instances of dog fatalities in the waters of the Tarn from Florac to Le Rozier.
This document, drafted with the technical support of various partners including the Agence régionale de santé (ARS), aims to address public concerns and enhance the safety of water sports in the Tarn basin, a key driver of regional development.

WHAT ARE CYANOBACTERIA?

Cyanobacteria are microscopic organisms. For many years, they were considered algae and were previously known as blue-green algae. In fact, they are organisms with bacterial characteristics (cells without nuclei) that are capable of photosynthesis. A vast array of species exists.

WHERE IS CYANOBACTERIA FOUND?

Their presence is not necessarily linked to pollution: they can be found in all environments, from the most natural to the most extreme. They may be found floating in the water (planktonic cyanobacteria) or attached to a submerged mineral or plant substrate (benthic cyanobacteria). It is the latter that are found in the waters of the Tarn. In conditions where there is warmth, light, and moderate water currents, they can colonize the bottoms of rivers.

Cyanobacteria biofilm

WHAT ARE THE ROLES OF CYANOBACTERIA?

Cyanobacteria contribute to the ecological functioning and particularly to the self-purification of water bodies, similar to sediments and other organisms (aquatic animals and plants, riparian vegetation, etc.).
Cyanobacteria can produce a variety of chemical compounds, some of which are highly beneficial (such as antibiotics, antivirals, and antitumor agents), while others are detrimental, including toxins known as cyanotoxins).

WHERE DO THE FLOCS COME FROM?

Benthic cyanobacteria typically flourish in currents, forming on the surfaces of pebbles within **biofilms** that host a variety of microorganisms, such as microalgae and bacteria. Under the effect of currents, boating activities or natural ageing, these biofilms detach and are swept away by the river to accumulate in the form of **flocs** in calm water areas.

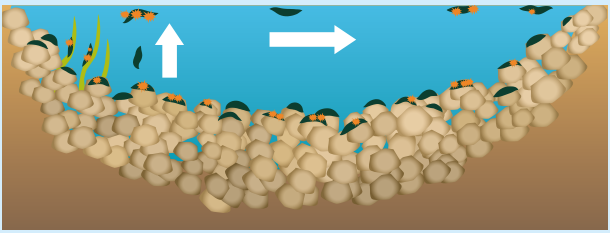


Schéma d'aménagement et de gestion des eaux
Contrat de rivière
Tarn-amont

WHAT PROBLEMS DO BENTHIC CYANOBACTERIA POSE?

Naturally present in river and lake waters, cyanobacteria can produce toxins without having the slightest impact on health. The problem arises when cyanobacteria are present in very large numbers and release large quantities of toxins.
In our rivers, the deaths of dogs from 2002 to 2023 were attributed to the ingestion of biofilms or flocs (see diagram opposite) which contained high concentrations of cyanobacteria and toxins.
The processes that facilitate the growth of benthic cyanobacteria and the generation of toxins are complex.
Preventive measures are advised to mitigate the risk of exposure to cyanobacteria and their toxins (see back cover).

Floc

HOW TO LIMIT THE DEVELOPMENT CYANOBACTERIA?

Preserve riverbank vegetation (riparian vegetation) to reduce light penetration and water temperature.
Maintain the diversity of flows (speed, depth) **and substrates** (sediment grain size, dead wood, aquatic vegetation, etc.).
Maintain a variety of habitats and species to encourage competition.
Promote the execution of coordinated measures across the entire catchment area.

WHAT MONITORING IS BEING CARRIED OUT ON CYANOBACTERIA IN OUR RIVERS?

Since 2004, local studies conducted by national and international experts (New Zealand) have enhanced our understanding of the situation.
Since 2012, the ARS and its partners have implemented a monitoring and risk management protocol, prioritizing public awareness. Analysis campaigns are carried out throughout the year.

INFORMATION TO REMEMBER AND PASS ON!

WHAT PRECAUTIONS TO TAKE AGAINST CYANOBACTERIA

Watch out for children!

DO NOT INGEST BIOFILM OR FLOC.

- Do not play with sticks or pebbles that have been submerged, and do not put them in your mouth.
- Do not swim in areas where flocs are present.

Floc

Cyanobacteria biofilm

Watch out for pets!

- Keep dogs on a leash and do not allow them access to the river.
- Think about dog-sitting!

Fishing recommendations

- Do not eat small fish whole; gut and head large fish quickly before eating or freezing.

The presence of cyanobacteria does not affect the quality of river water.

WHAT ARE THE SYMPTOMS OF CYANOBACTERIAL TOXIN POISONING?

Cyanotoxins from our rivers can affect the nervous system if absorbed.

- If symptoms such as trembling, fever, abdominal pain, muscle pain, nausea, or vomiting occur after swimming… **seek medical attention immediately**.
- If a dog shows symptoms such as: trembling, loss of balance, nausea, bulging eyes, drooling, etc. after entering the river, **take it to a vet as soon as possible**, and if possible collect any vomit.

SOS 112

If you find a dead animal, do not touch anything and notify the French Office for Biodiversity
Lozère: 04 66 65 16 16
Aveyron: 05 65 87 07 31
Gard: 04 66 62 91 10

MORE INFORMATION

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Consult the interactive map from 1 July to 31 August
https://www.tarn-amont.fr/cyanobacteries

Syndicat mixte du bassin versant Tarn-amont

ars Agence Régionale de Santé Occitanie