

# Increasing temperatures turn water into poison for people and animals

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PEOPLE and animals are facing growing health risks as South Africa's dams and rivers become more poisonous because of climate change and higher pollution loads.

Water scientist Paul Oberholster has warned that toxic algal blooms are becoming more common in water bodies around the country, because of higher temperatures, posing a "significant threat" to people and animals.

He says toxic blooms of blue-green algae can cause liver damage and nerve system problems at very low levels of exposure, while higher levels have killed hundreds of cattle and wild animals and thousands of fish in recent years.

Writing in the African Journal of Biotechnology, Oberholster, a senior freshwater ecologist at the Council for Scientific and Industrial Research (CSIR), has also called for a new early-warning system and stricter water quality guidelines for drinking water.

The article says the number of toxic cyanobacterial (blue-green) algal blooms is likely to become more frequent in the coming years if current climate change trends continue.

Adding to the problem is an increasing load of partly treated sewage, nutrients and farm pollution, which encourage the growth of these bacteria.

"In South Africa, most drinking water comes from surface waters, where cyanobacteria have been found in many, if not most instances," said the CSIR.

Last year, former water affairs minister Lindiwe Hendricks told Parliament that 11 percent of the country's largest dams and rivers showed signs of significant-to-severe algal blooms, while 58 percent of other frequently tested water bodies were vulnerable to the blooms. The worst-affected areas in KwaZulu-Natal include the Shongweni Dam and EJ Smith Dam, while a toxic bloom was also found in Midmar dam in 2005 – the first national record of such a bloom in the winter months.

## Hotter

Algal blooms are more common in the hot summer months, but Oberholster and fellow researchers from Stellenbosch University and the University of Pretoria say there is now a strong correlation between more frequent blooms and hotter winter temperatures.

"The massive proliferation of these organisms in rivers and lakes is largely due to progressive eutrophication (nutrient pollution).

"However, a warming trend in the southern hemisphere, with minimum temperatures increasing three times faster than maximum temperatures, is likely the cause of the increasing occurrence of toxic cyanobacterial bloom-forming species," Oberholster said.

From the perspective of guarding human health, he noted that the World Health Organisation (WHO) recently adopted new drinking water guideline levels

for some of the more toxic (microcystin) algae species.

"In the case of South Africa, there are guidelines for cyanotoxins in domestic water (only for microcystins) but values are not specified for drinking water guidelines or national drinking water standards," he said.

Responding to similar concerns raised last year, Umgeni Water said tests on water from the Midmar dam system showed no signs of toxic algae contamination and the organisation's alert level for these toxins was stricter than WHO levels.

"As far as Umgeni is concerned, there is no exposure (to algal toxins) with respect to potable water," said spokesman Shami Harichunder.

Nevertheless, some of these water toxins have been implicated in liver damage and several human deaths in rural China.

A study in Australia in the early 1980s showed links between human liver damage and algae-polluted water in New South Wales, and 60 kidney dialysis patients died in Brazil in the 1990s after being exposed to microcystins.

Oberholster said the number of cattle and wild animal deaths in South Africa had increased steadily since the mid-1990s because of toxic blooms.

Last year, more than 70 bush-buck and impala died on the northern border with Botswana while scores of lion, rhino, cheetah and other species have died in the Kruger National Park after drinking algae-polluted water in the past three years.

