

A guide to the effective use of the South African national water quality database for monitoring change

South Africa's database of surface water quality is widely used as a chronicle of change in rivers and dams. However, users need to be aware of the limitations of the database if they are to draw meaningful conclusions.

Some records on the database date to the 1960s, spanning a longer period than many working careers, so even the database curators have only a vague idea of how these early samples were collected, stored and analysed.

Additional layers of complexity include method changes and fluctuating detection limits. Delays before analysis are not always apparent. Some results are from archived paper documents with no method description.

The database has a few instances of overlapping datasets, where two entities unwittingly sampled the same site for months or even years: these periods of overlap provide a useful insight into the reliability of methods.

The database records the institutions that provided data—mainly DWS—and their analytical methods.

Oral sources are disappearing, so distinguishing between outliers and interesting results becomes a puzzle. In some cases, aquatic chemistry rules out impossible concentrations—in others, unlikely results may be true. Hartbeespoort Dam has some record chlorophyll results, for example.

A sad trend is the decrease in the rate and extent of water quality monitoring, which has declined by 50% since 2008. Indirect methods such as numerical modelling and remote sensing, if we can afford them, will increase in importance as ways of patching up the widening gaps in South Africa's surface water monitoring network.