

RiverWatch™ Predictive Model

RiverWatch™ is Sydney Water’s environmental monitoring and reporting program, established to support safe swimming in urban waterways. The RiverWatch predictive model issues daily pollution forecasts for our monitored sites, allowing the public to make informed decisions about when and where to swim.

The need for a new approach

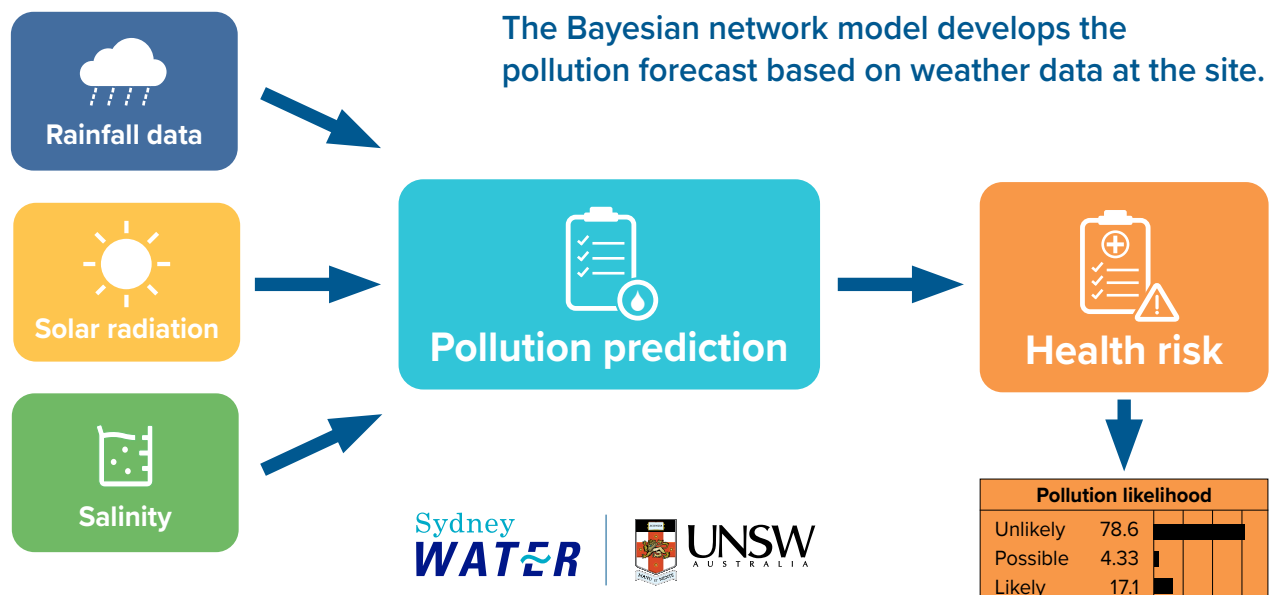
Water quality is strongly influenced by external factors such as rainfall in the catchment, potentially leading to short periods of elevated faecal pollution.

Contamination of recreational water with faecal matter can lead to health problems because of the presence of disease-causing microorganisms (pathogens).

Traditional field sampling and lab analysis techniques can have a delay of up to 72 hours between sampling the water and understanding if water quality was suitable for swimming. To overcome this barrier, the World Health Organization and the National Health and Medical Research Council support the development of a predictive modelling approach.

Sydney Water is pioneering the use of a predictive model to overcome delays in reporting water quality.

RiverWatch Model



How does the predictive model work?

The Bayesian Net predictive model was developed by Simon Lloyd of the University of NSW (UNSW) as part of his PhD dissertation.¹

Models are developed for individual sites by analysing the impact of key environmental factors on the levels of faecal indicator bacteria identified during routine sampling. Once the relationship between environmental changes and pollution is understood, we can determine the health risk from swimming at the site.

The models have been automated within Sydney Water’s digital platform and are updated with continuous data feeds from the Bureau of Meteorology. The accuracy of the models is verified with water quality information collected during routine monitoring.

The model contains a machine learning component, meaning that over time the accuracy of the predictive model will continue to improve as we gather more data.

Reporting results

As a general precaution, swimming in Sydney’s harbour and river sites should be avoided for up to 3 days after rainfall, or if signs of stormwater pollution are present. The most obvious sign of stormwater pollution is water discolouration, as well as debris in the water and on the tide line.

The model provides a prediction of bacterial contamination and then the following thresholds are applied (see above):

Predicted amount of faecal indicator bacteria pollution	Water quality rating
Less than 35 CFU/100ml	Pollution unlikely
35-51 CFU/100ml	Pollution possible
Greater than 52	Pollution likely

Source: Wyer et.al. (1999) An experimental health-related classification for marine waters. Water Research, Vol 33, Issue 3, Feb 1999, pages 715-722.

Reading the forecast

Forecast predictions are issued daily at 8am and may be updated during the day if conditions change.

The forecasts are developed based on information provided by the Bureau of Meteorology and Sydney Water rain gauges.

Water quality rating

- Pollution unlikely**
 Pollution is unlikely, enjoy your swim!
- Pollution possible**
 Pollution is possible, take care.
- Pollution likely**
 Pollution is likely, avoid swimming today.
- Coming soon**
 No water quality rating available at the moment.

Like more information?

To learn more, visit www.urbanplunge.com.au or email riverwatch@sydneywater.com.au.

¹We acknowledge the intellectual property that UNSW holds for the RiverWatch predictive model.