How will climate change affect investment decisions in water treatment infrastructure?

Development of an application test bed piloting use of downscaled climate projections in water quality modelling

This project was undertaken using the SA Climate Ready data, which is helping to improve planning and decision making and make South Australia the most climate ready State in the nation.

"Gaining insight into the potential impacts of climate change on water quality in our reservoirs will help us to plan future operations of water treatment plants across the State."

Jason West, SA Water

Project partners:

SA Water

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Climate change could negatively impact water quality in South Australia. Some of the potential impacts are related to the movement of water in reservoirs in response to temperature gradients in the water column. Improved understanding now will inform planning for future investment in water treatment infrastructure.

Why undertake the project?

SA Water is responsible for delivering safe, sustainable and affordable water services to more than 1.5 million South Australian customers.

Changes in the frequency and intensity of events such as heat waves and extreme low flows followed by high flows all have the ability to affect reservoir water quality.

For example, they can trigger the development of blue-green algae (cyanobacteria) blooms leading to episodes of elevated iron and manganese concentration which in reservoirs in turn impact the cost of treating water to meet drinking water standards.

What was done?

Historically, SA Water has used reservoir water quality models to investigate the potential for management actions to impact on the quality of the water supplied to water treatment infrastructure. Examples of management actions include artificially mixing the water column (destratification) and releasing water from different heights on reservoir walls (multi-level offtake selection).

Using SA Climate Ready data on temperature, precipitation, radiation and vapour pressure, SA Water was able to pilot approaches for using existing reservoir models to better understand the likely impacts of climate change on water quality. Climate projections for intermediate and high emissions scenarios were considered.

What did we learn?

The pilot produced a new data set for use by SA Water, which will be applied to reservoir water quality models as part of integrated modelling schemes, consisting of coupled catchment and reservoir models to evaluate the direct versus indirect impacts to water quality resulting from climate change.

Continued use of this data will help to inform future investment decisions about the type and scale of water treatment infrastructure required in South Australia.

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The Goyder Institute for Water Research is a partnership between the South Australian Government through the Department of Environment, Water and Natural Resources, CSIRO, Flinders University, University of Adelaide and the University of South Australia.

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