Using historical data to identify future water quality trends at a regional scale

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Climate change is expected to have a severe impact on water resources management in Australia. This is expected to lead to increasing frequency in extreme hydrological events such as droughts and floods, which will in turn contribute to higher risks of bushfires, fish kills, and water shortage for both humans and the environment. The potential impacts of these climate-change-induced extreme events on the quantity of water available to humans and the environment are relatively well understood. However, we have little understanding of the effect on the water quality of Australian rivers. This project aims to start filling this gap in our understanding.

Our key objectives are:

(1) to identify how extreme hydrological events such as droughts and floods have affected river water quality over the last two decades, and explore how spatially variable these impacts have been across the Australian continent.

(2) to use these past observations as a basis to predict how river water quality will be affected by climate change across the continent, and identify the locations within Australia that will be most vulnerable to water quality deterioration in the near future.

There is a wealth of historical water quality data for each state in Australia, but these datasets have not yet been investigated systematically to develop a nation-wide understanding of water quality patterns. We believe that only a continental-scale understanding of the response of river
water quality to extreme hydrological events will allow for the development of robust predictive models of climate change impacts on water quality. Knowing the potential hotspots for future water quality deterioration will be a key step towards identifying priorities for catchment planning and management.

In this poster, we will present the preliminary findings of this project by detailing the spatial variability in the impact of hydrological events on water quality across the state of Victoria in South-East Australia.