Modelling Water Quality Parameters After Bushfires Using eWater

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ABSTRACT

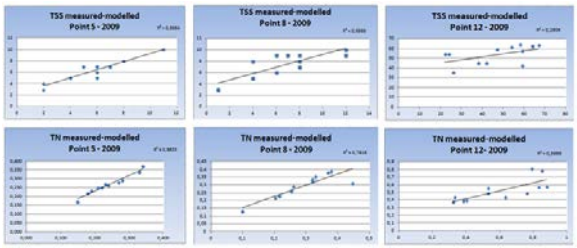
The population growth in urban areas leads to a higher demand in water supply. The quality of water is a very important factor not only from the aesthetic point of view, but also for the health purposes.
This research is designed to develop a spatial approach to support the planning of the water quality in the areas subjected to bushfires, in the State of Victoria. In particular, this research involved the implementation of a hydrological model in order to predict the river water quality, to assist in the decision-making process.
The impact of bushfires on water quality can be highly variable for many of the individual water quality constituents. This variability is caused by a number of landscape influences and climatic factors, most notably rainfall. High magnitude and intensity rainfall events soon after fire generate large impacts on water quality and sometimes trigger extreme erosion events.
There are many important water quality parameters that must be taken into account when the water is delivered to the population. For some of the water quality parameters there is very little information available, which makes it difficult to draw conclusions about bushfire impacts. The monitoring campaigns are very expensive and better options would be the modelling tools. The challenge is to find the best parameterizations for the rainfall runoff models and constituent generation models.
The outputs of the model showed higher concentrations of suspended sediments and nutrients after bushfires.
However, because of the limited number of water quality data available, the evaluation of the model is still in progress.

Water pollutants of interest

Total Suspended Solids (TSS), Total Nitrogen (TN)

Summary of findings

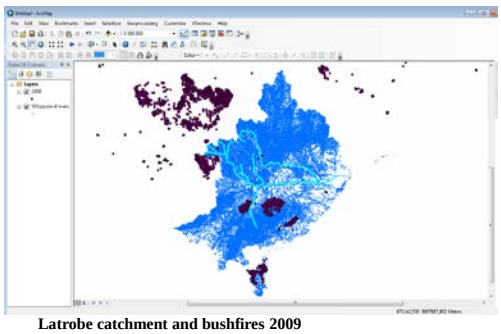
The correlations between the modelled and the measured data Latrobe catchment



Research Questions

What information is required to establish the water quality and what are the gaps in existing local water quality databases?
How can a hydrological model be used to integrate datasets, to provide missing information in existing water quality database?
Which pollutants are affected by fire and by how much?
How can we predict future impacts?

The study site -The Latrobe Catchment
Reasons for choosing this study area:
-it is a bushfires prone area and
-for the data availability.



Latrobe catchment and bushfires 2009

Conclusion

The outputs of this research could be used by the authorities for the catchment management plan, for the remediation initiatives as well as in the design of monitoring programmes aimed to identify the status and trends of water quality in that catchment.
This study could be important in order to prioritize the pollutants in a catchment, which is essential with regard to future catchment management.
This research is still in progress.

End User: Craige Brown from Melbourne Water: This work models post-fire pollutants which can cause serious water quality issues. Better understanding of which pollutants are affected and the ability to model these pollutants will help predict post-fire effects. This will assist with developing programs to mitigate the effects of fire on water quality.

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