Predicting Water Quality Parameters in Latrobe catchment using eWater Source

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ABSTRACT

In this research the impact of bushfires on Total Suspended Solids (TSS), Total Nitrogen (TN) and Total Phosphorus (TP) in Latrobe catchment was predicted, for 2008-2016. The hydrological model applied (eWater Source), found higher levels of pollution after bushfires followed by rain, in accordance to the measured values, in the 6 monitoring points from Latrobe river, which were considered for this research. However, the model overestimated the pollution levels. At this stage, a new land use (mining) was introduced in the model and the results were much improved.

OBJECTIVE

To develop a spatial approach in order to predict the river water quality, in the areas subjected to bushfires.

RESEARCH QUESTIONS

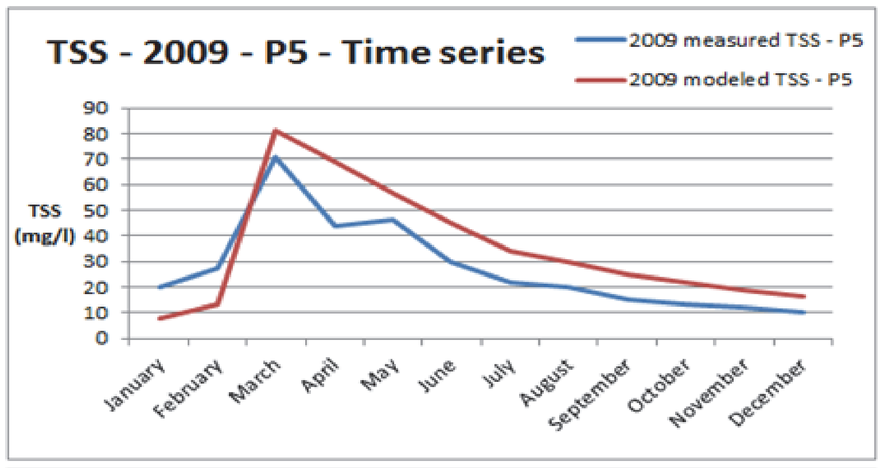
- What information is required to establish the water quality and what are the gaps in existing local water quality databases?
- How can a hydrological model be used to integrate datasets, to provide missing information in existing water quality database?
- Which pollutants are affected by fire and by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

WATER POLLUTANTS OF INTEREST

- Total Suspended Solids (TSS),
- Total Nitrogen (TN)
- Total Phosphorus (TP)

Figure 1: Photo of Latrobe River, Victoria, Australia

PILOT AREA



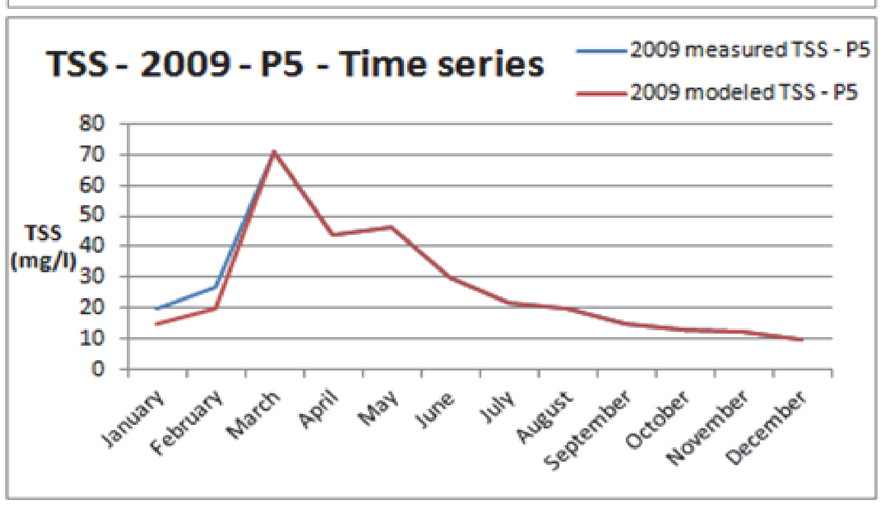
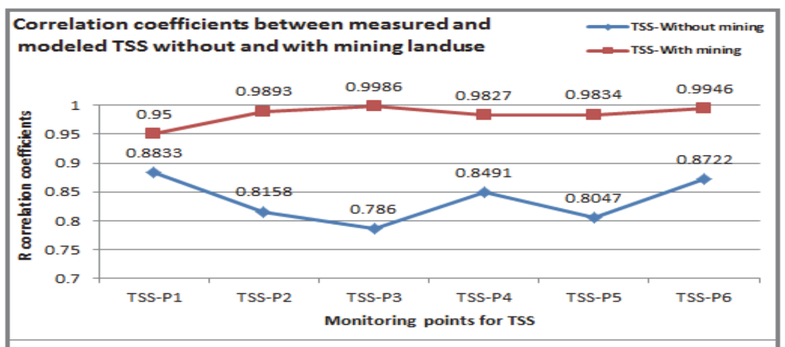
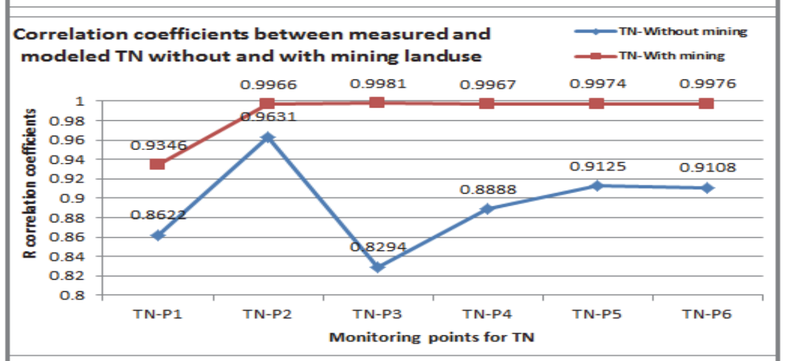


Figure 2: Time series for measured and modelled TSS, for 2009, without mining land use (a) and with mining land use (b)

(a)



(b)



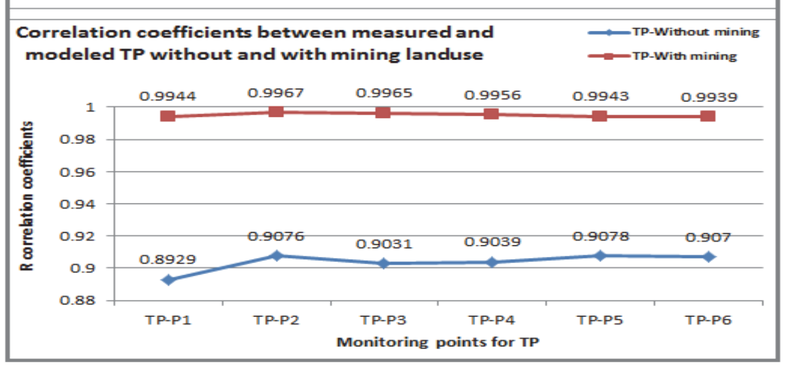


Figure 3: Correlation coefficients for TSS, TN and TP in 2009, without and with mining land use

CONCLUSIONS

- The model well predicted the TSS, TN and TP in period 2008-2016 in all 6 monitoring points from Latrobe river.
- The model predicted higher level of TSS after bushfires (up to 7 times) and the concentrations returned to normal after almost two years.
- The levels of modelled TN increased up to 9 times after 2009 bushfires, and they gradually decreased until 2011.
- The TP levels in 2009 were predicted up to 5 times higher compared to the previous years, and they returned to normal after 4 years.

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