

Surface Water Quality in the Upper Namoi

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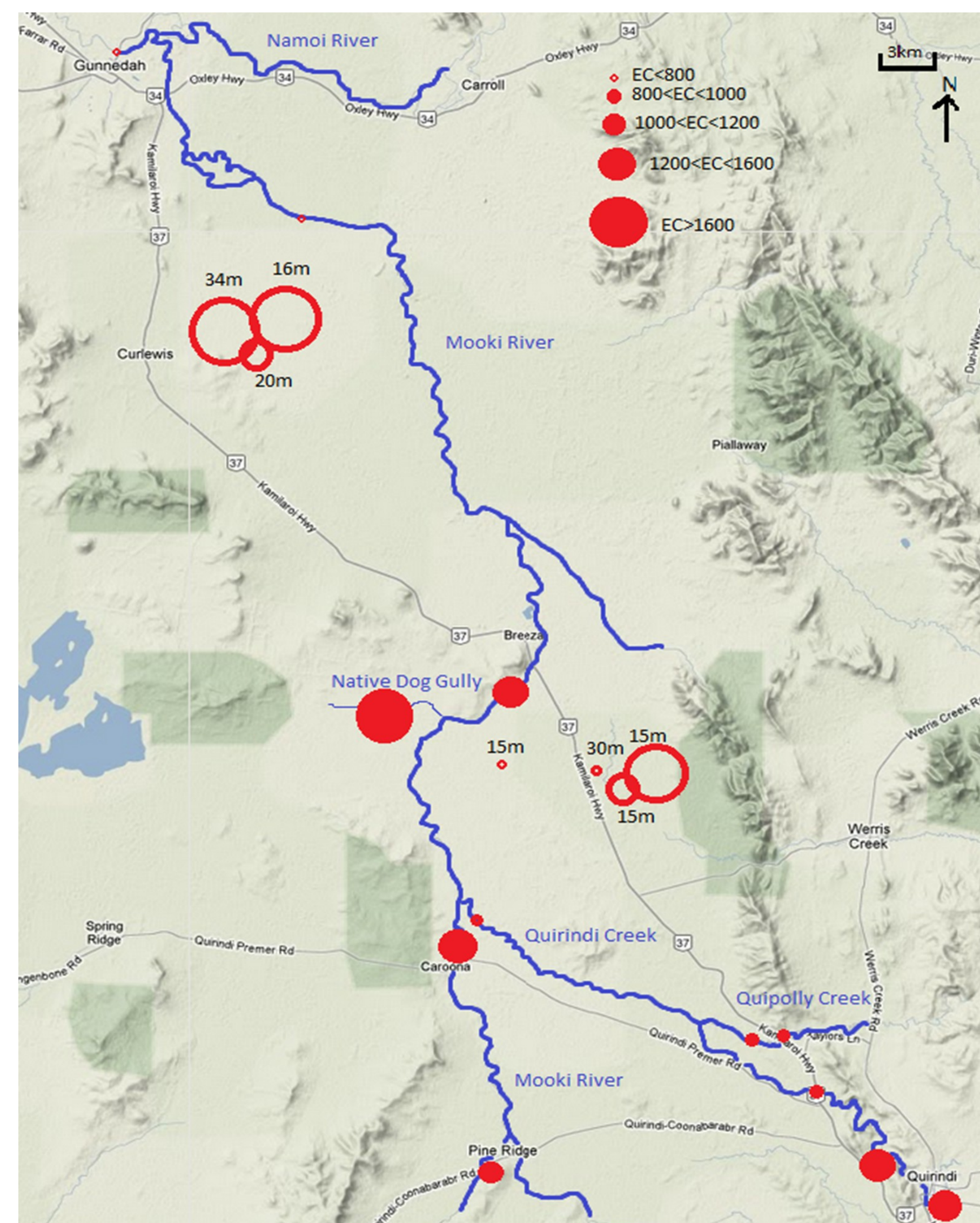
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This project examined a wide range of water quality parameters of surface water and groundwater in the Quirindi-Gunnedah area including trace elements, nutrients, agricultural chemicals, stable isotope ratios, organic carbon content and trace organic constituents. Samples were obtained in October 2011 and January 2012.

Trace organics of anthropogenic origin, including pharmaceuticals, cosmetics and caffeine, were widely detected in both surface and groundwater, though were not of concerning concentrations. Atrazine and simazine exceeded guidelines for the precautionary ANZECC aquatic ecosystem protection guideline (99% of ecosystem inhabitants). However compliance with crop and drinking guidelines and low frequency of higher detections indicates these results are not of a major concern.

Native Dog Gully had salinity, sodium and chloride measurements that significantly exceeded crop and drinking water salinity guidelines. Although flushing of this salt to the Mooki River system is infrequent, salinity monitoring in this area should continue.



Left: Distribution of EC values ($\mu\text{S cm}^{-1}$), grouped into 4 categories. Surface water and groundwater readings are represented by solid and open circles, respectively. Surface water salinity was mostly within Namoi CMA targets ($<1500 \mu\text{S cm}^{-1}$). However, groundwater salinity was found at levels above or approaching the Namoi CMA's upper limit of the guideline for irrigation water.

All values in tonnes/year	Mooki '11	Namoi '11	Namoi Measured '98	Namoi Predicted '20
Yearly Salt Load	14,700	128,600	135,600	305,000

Above: Comparison of yearly salt loads in 1998 and 2011 and 1998 predictions for increase (Beale et al. 1998).

Below: Comparison of Atrazine detections from '11/'12 with '96/'97 and Atrazine Guidelines (Timms et al. 1997)

Values in $\mu\text{g L}^{-1}$	Total '11/'12	Total '96/'97	Aus. Drinking Water Guidelines
Range of detections	0.005-5	0.04-14	20
Mean	0.57	0.42	ANZECC Aquatic Ecosystem Guidelines
Median	0.06	0.02	0.7 (99%)
Frequency of detections	25/30	34/84	ANZECC Primary Industries Guidelines
Percentage	83	41	10

