

Report of the George River Water Quality Panel

June 2010

An investigation into the *Australian Story* report:
'What's in the Water?'



George River Water Quality Panel Members

Dr Graeme Batley (ecotoxicology, water quality)

Dr Christine Crawford (oyster health)

Prof Michael Moore (ecotoxicology, water quality)

Prof John McNeil (epidemiology)

Prof Jim Reid (eucalypt biochemistry)

Coordinating Scientist: Dr Lois Koehnken

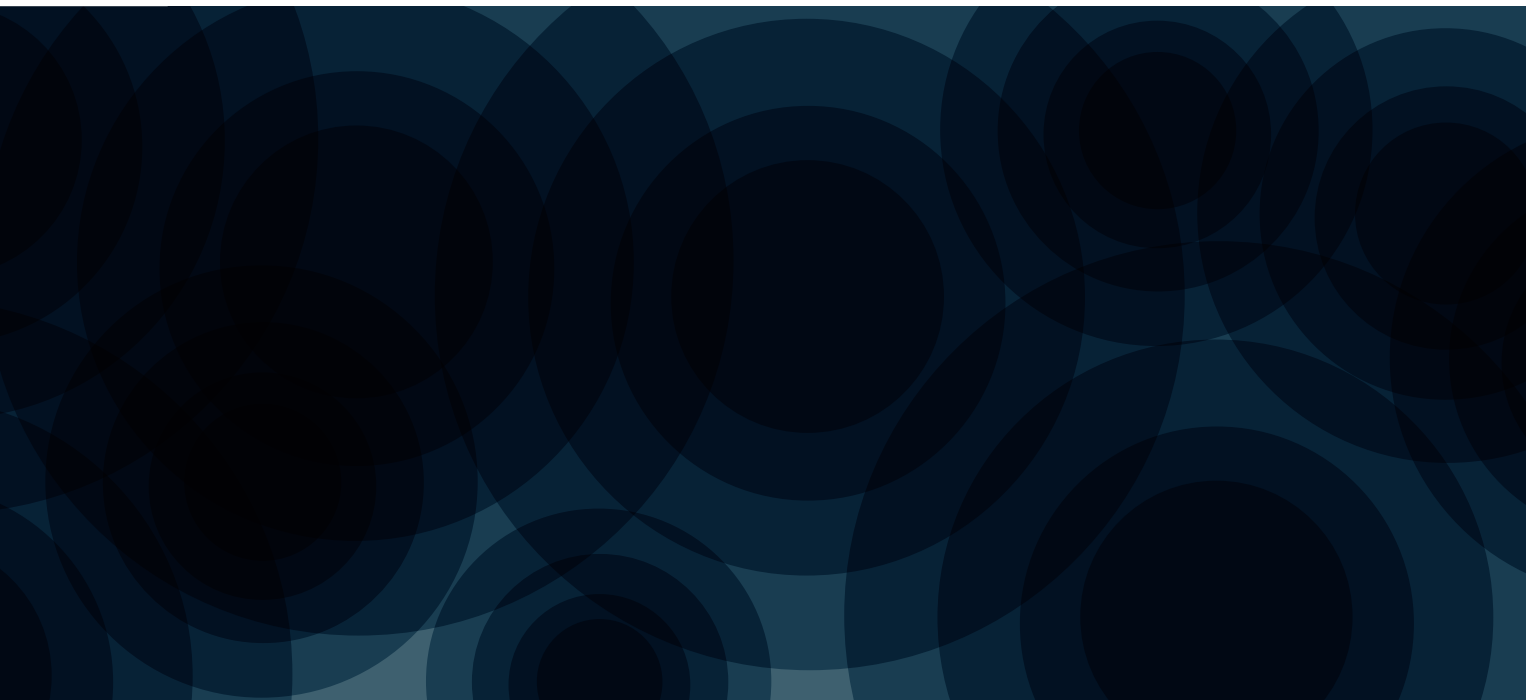
Convenor of the Panel: Mr John Ramsay

www.georgeriverwater.org.au

The George River Water Quality Panel

" There are no abnormal cancer rates within the St Helens drinking water area based on community health records for the period 1993–2007."





The George River Water Quality Panel was convened at the direction of the Premier of Tasmania in March 2010 to investigate information reported on *Australian Story* on February 15th and 22nd. In the program allegations were made by ecologist Dr Marcus Scammell and General Practitioner Dr Alison Bleaney that toxicants in river foam, derived from *Eucalyptus nitens* plantations in the George River catchment, were having a deleterious effect on human health in the St Helens community, who rely on the George River for drinking water, and on the health of commercial oyster farms in Georges Bay.

The George River Water Quality Panel (GRWQP) includes nationally and internationally recognised experts in the area of human health epidemiology, ecotoxicology, water quality, oyster health, and eucalypt biochemistry. Members of the Panel include: Dr Graeme Batley (ecotoxicology, water quality), Dr Christine Crawford (oyster health), Prof Michael Moore (ecotoxicology, water quality, Prof John McNeil (epidemiology), Prof Jim Reid (eucalypt biochemistry). The Panel was convened by John Ramsay and assisted by Coordinating Scientist Dr Lois Koehnken.

Summary of Findings

The Panel has completed an in-depth review of the issues associated with human, oyster and ecosystem health and have found the following:

There are no abnormal cancer rates within the St Helens drinking water area based on community health records for the period 1993–2007. The incidence and pattern of cancer within the region is consistent with the profile of the community, and did not show any characteristics of a ‘cluster’. These findings are supported by a number of General Practitioners in the region who have not observed any unusual levels or clusters of disease.

The deflated river foam samples used for the investigations presented on *Australian Story* were highly concentrated by the ‘skimmer box’ sampling apparatus used to collect the foam. The extreme concentration of the foam (>1000-fold) created by the skimmer box accounts for the experimental toxicity of the foam to sensitive test organisms. The toxicity is likely due to highly concentrated naturally occurring plant compounds, which at natural concentrations are not toxic. The Panel concludes that this foam poses no health risk to the St Helens community and no additional investigations regarding the highly concentrated river foam are required to clarify the issues raised on *Australian Story*.

The toxicity in the concentrated foam samples from the George River cannot be attributed to *Eucalyptus nitens* alone as postulated on *Australian Story*, as toxicity has also been detected in concentrated river foam from Crystal Creek, a catchment devoid of *E. nitens* plantations;

The natural compounds present in the foam pose no threat to the ecosystem at naturally occurring levels as shown by ecosystem testing (AUSRIVAS) of the South George and Ransom Rivers which shows the rivers are in near pristine condition.

There is no evidence that pesticides in the drinking water supply in St Helens pose a health risk to the community. Insecticides have never been detected in the water supply system at St Helens. Traces of herbicides have occasionally been detected during high flow in the river. The herbicide concentrations during these short events have been well below human health guidelines and present no human health risk. The risk of herbicides entering the water supply during high river flow is low because pumping of water from the river is minimised during such periods.

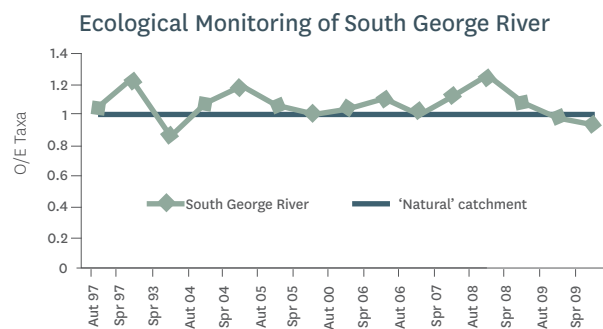
"There is no evidence that pesticides in the drinking water supply in St Helens pose a health risk to the community."



ABOVE: GRWQ Panel meets with stakeholders during investigation

It is apparent that Pacific oysters growing in Georges Bay are subject to multiple stressors including temperature, grading, fresh water, toxic algae, turbidity, oyster stocking densities, TBT, other antifouling agents and other catchment-derived contaminants. Contaminants associated with river or bay foam *may* be an additional but minor stressor on oyster health;

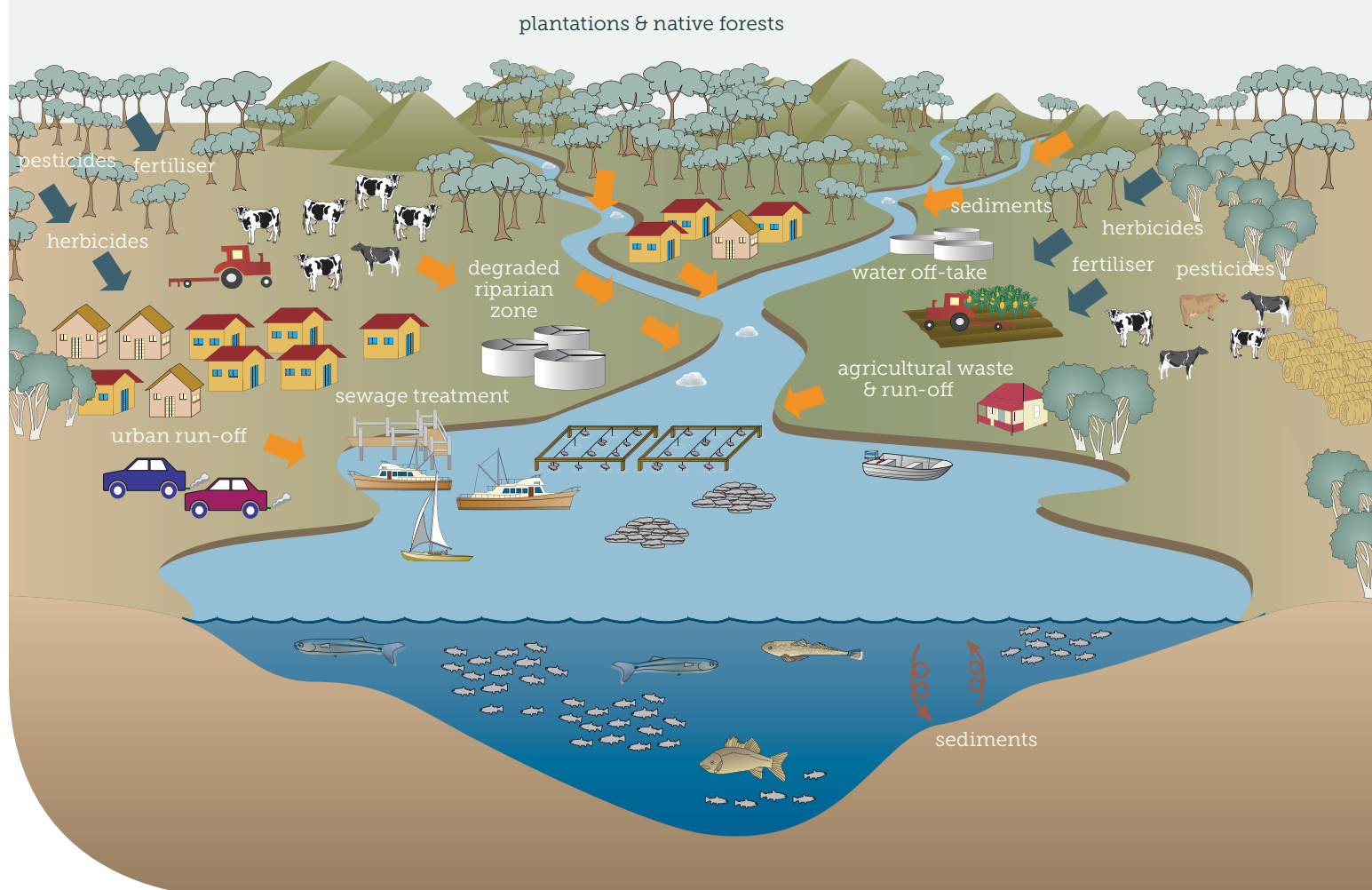
To maintain public confidence in the quality of St Helens drinking water and Georges Bay waters, improved and co-ordinated catchment management and administration should be considered as a matter of priority. Information on the use of chemicals in catchments should be recorded by all users, and those records made available as required to assist with catchment monitoring and the security of water.

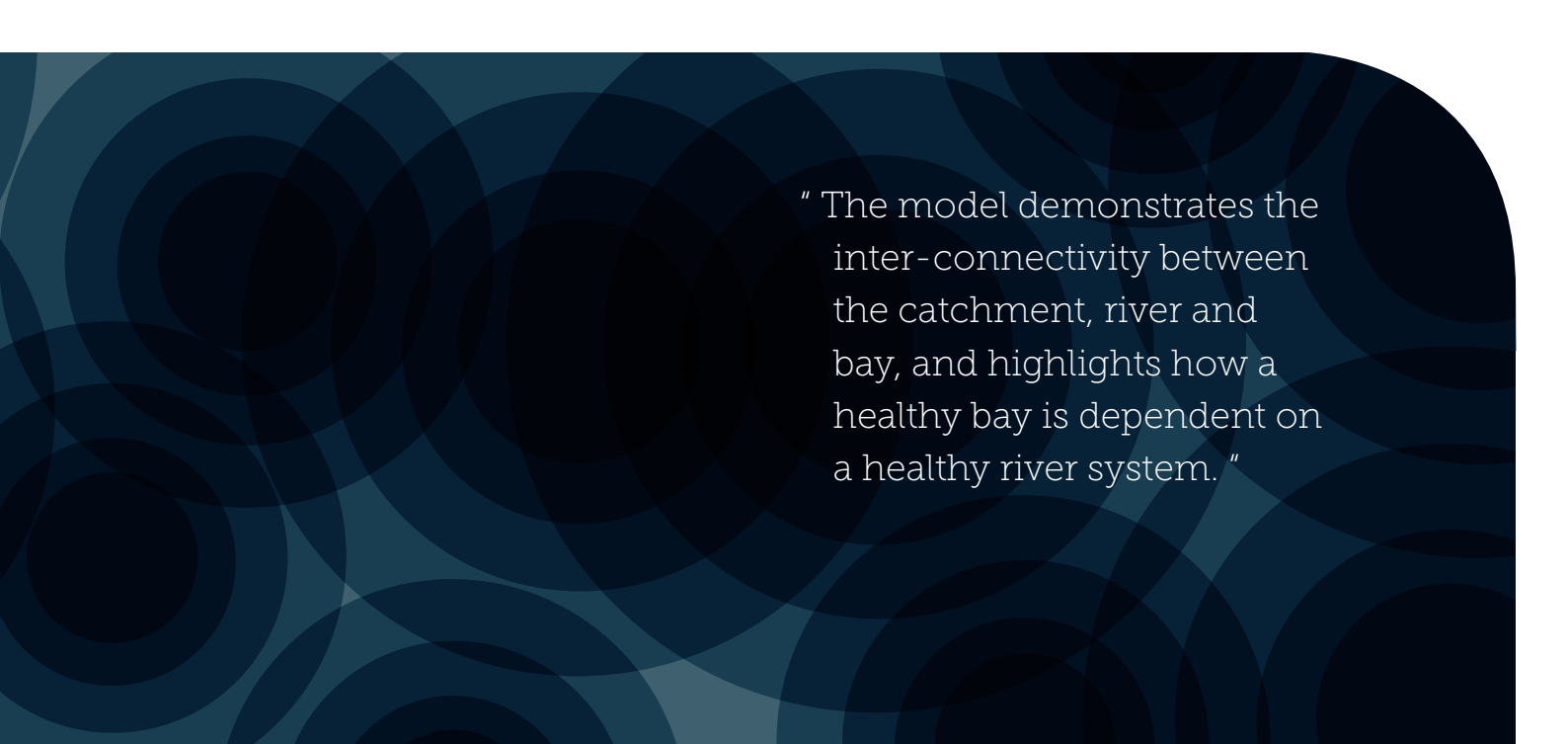


ABOVE: Ecological monitoring in the South George River has found a near pristine ecosystem. An undisturbed natural river would be expected to have a value of '1' or higher in the graph above. The score for the South George River has been between 0.9 and 1.3 since 1997. Monitoring completed by DPIPW.

Conceptual site model

To summarise the issues investigated and highlight the importance of good catchment management, the George River Water Quality Panel developed a conceptual site model of the Georges Bay catchment (below).





“ The model demonstrates the inter-connectivity between the catchment, river and bay, and highlights how a healthy bay is dependent on a healthy river system. ”

To summarise the issues investigated and highlight the importance of good catchment management, the George River Water Quality Panel developed a conceptual site model of the Georges Bay catchment (left). This is a standard process that is recommended in undertaking a monitoring and assessment program (ANZECC/ARMCANZ, 2000b). The model shows all of the factors and pathways which can affect water quality in the George River. These include the contribution of natural organic matter from eucalypts and other vegetation in the catchment, sediment from bank and land erosion, and runoff and discharge from agricultural, domestic, municipal or silviculture activities. The more hydrophobic (not able to be dissolved in water) of these contaminants can be transported to the surface microlayer of the river system where they accumulate. This surface film is extremely thin and contains a low concentration of foam bubbles formed from entrained air rising to the surface. The compounds in this surface film do not exhibit toxicity to sensitive biota such as cladocerans (water fleas), unless highly concentrated over 1000-times and collapsed (deflated) which transforms the foam into fine particles.

The river water itself is not toxic to biota and does not represent a threat to human health via the drinking water supply. Any particulates which are present in the water supply occur at low concentrations and would be effectively removed by the drinking water treatment process, presenting no human health risk.

The model also shows that within Georges Bay, water quality can be affected by runoff from the land, inputs from the sewage treatment plant, boats and slipways, and the movement of sediment and any associated contaminants. As in the river, many contaminants, if present in the bay, will be concentrated in the surface film of the bay where they can become associated with foam floating in the bay (this foam differs in composition from river foam). The wind-blown movement of this foam is one mechanism which could move contaminants around the bay and affect water quality.

Another process which affects water quality in the bay is the mixing of fresh and salt waters and foams near the mouth of the river which results in the deposition of fine-sediments. These fine particles may contain elevated concentrations of any contaminants entering from the catchment.

The concentrations of these particles are not likely to be sufficient on their own to harm Pacific oysters. There are, however, a number of other stressors that affect oysters and the collective effect of all of these might contribute to some of the problems with oyster mortality. Other stressors include freshwater, temperature, toxic algae, handling, spawning, antifouling agents, resuspended sediments and food sources.

The model demonstrates the inter-connectivity between the catchment, river and bay, and highlights how a healthy bay is dependent on a healthy river system.

