

The impact of stormwater from towns on rivers & streams

Ian Rutherford

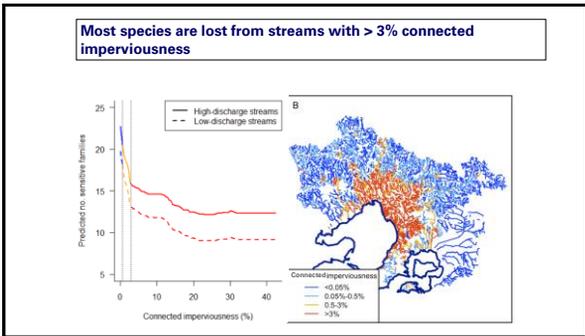
Victorian Stormwater Conference, 2019



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All of Jeparit on the banks of the dry Wimmera River  
2007



<https://tonywheeler.com.au/return-of-the-vabby/>

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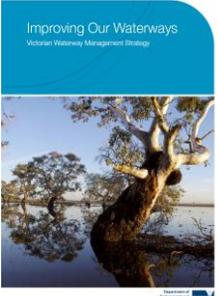
- Journal of the North American Benthological Society 28(1):1080-1098, 2009
- Twenty-six key research questions in urban stream ecology: an assessment of the state of the science
- They describe 'urban streams' – what are they?
- NO questions related to the size, or arrangement of towns

**Focus is on the urban streams rather than on the effect of urbanization on the total stream system**

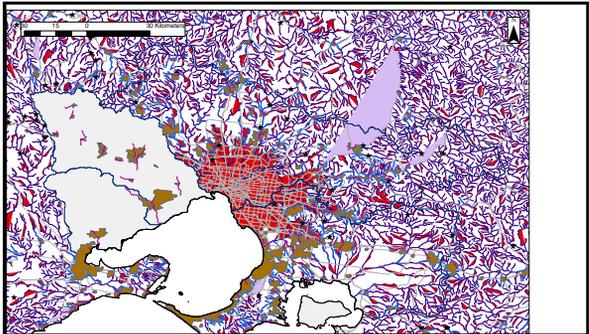


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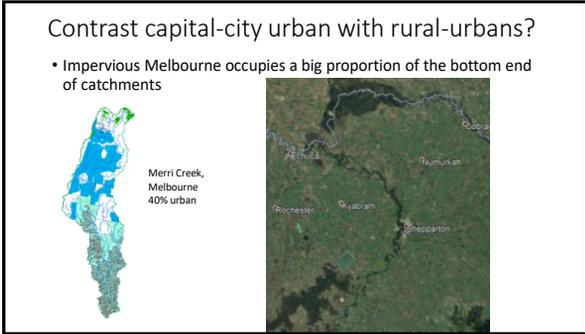
VWMS (2013) Chpt 14  
"Urban Streams"



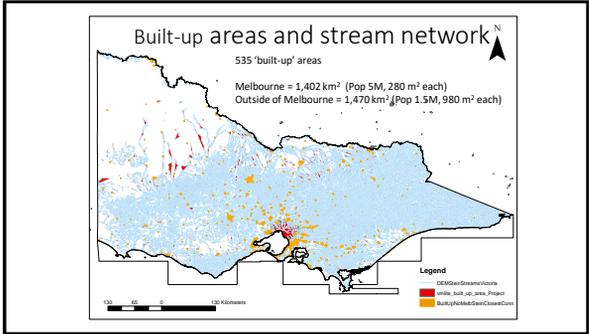
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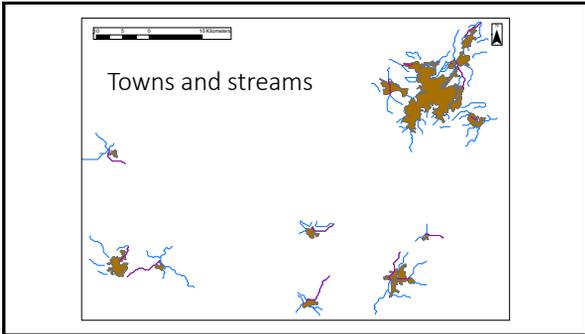
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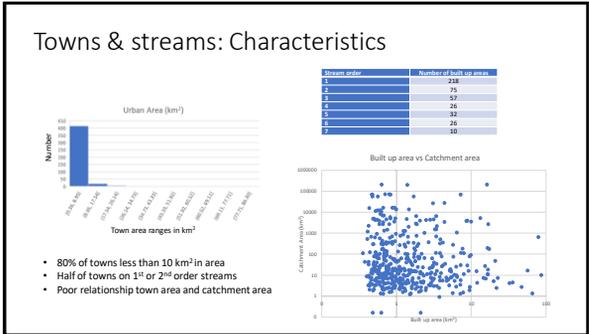
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Potential impact of towns  
Up and downstream progressing disturbances  
*(Towns usually embedded in rural landscapes)*

**In the town**

- Local channelisation
- Floodplain constriction/isolation

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Potential impact of towns  
Up and downstream progressing disturbances  
*(Towns usually embedded in rural landscapes)*

**Downstream**

- Pollutants (stormw./sewage/industrial)
- Hydrological disturbance
- Altered sediment supply

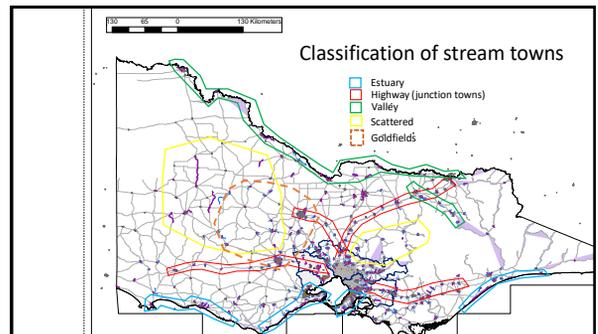
**In the town**

- Local channelisation
- Floodplain constriction/isolation

**Upstream**

- Backwaters
- Knickpoints (erosion)
- Barriers to migration

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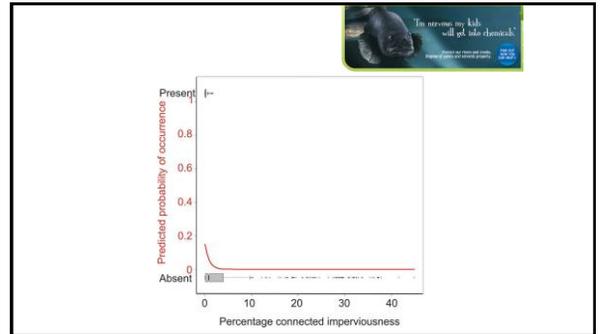
All towns have a cumulative effect

*Dispersed Towns*  
E.g. Towns of the Upper Maribyrnong



The map shows a catchment area with several towns marked by blue circles. A legend on the left lists various land use types and their associated runoff coefficients. The towns are distributed across the catchment, illustrating how their combined effect impacts the downstream environment.

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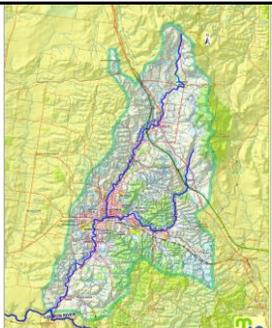
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Castlemaine?

5% of Forest Ck.

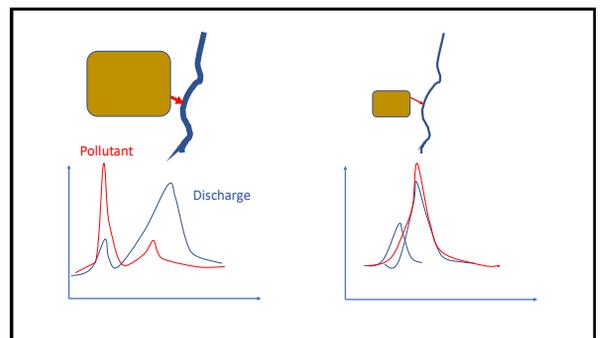
But what does this mean?

*Hydrograph peaks?*

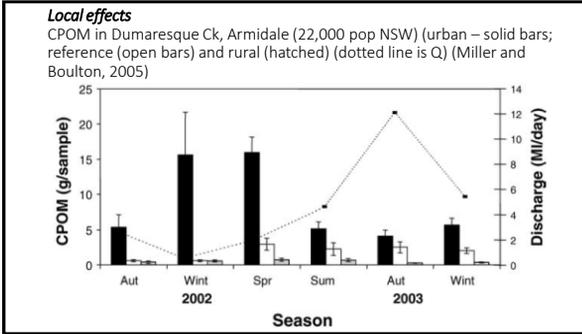


The map shows the topography of the Castlemaine catchment, with a river network highlighted in blue. The terrain is hilly and forested, with some urban areas indicated by red and grey patterns.

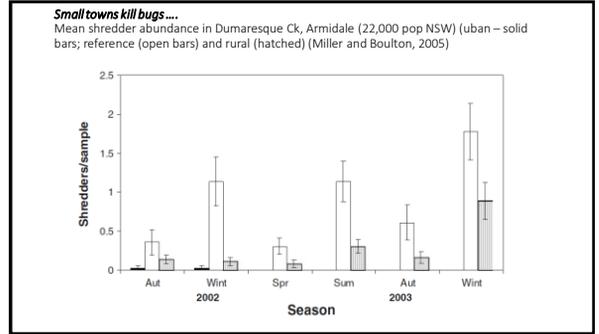
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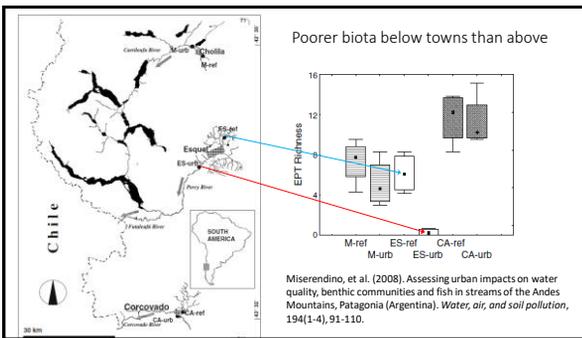
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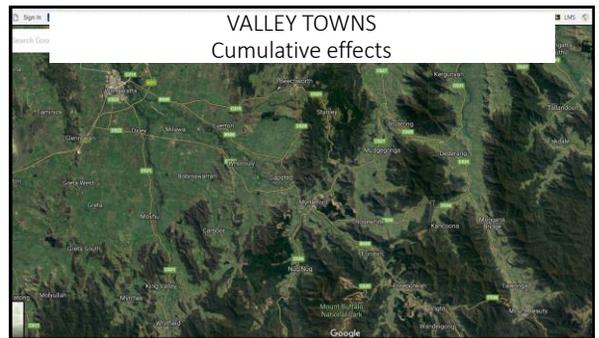
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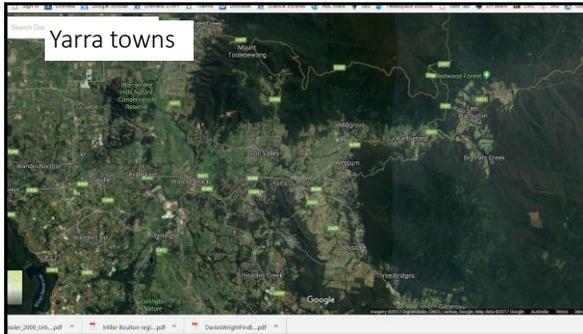
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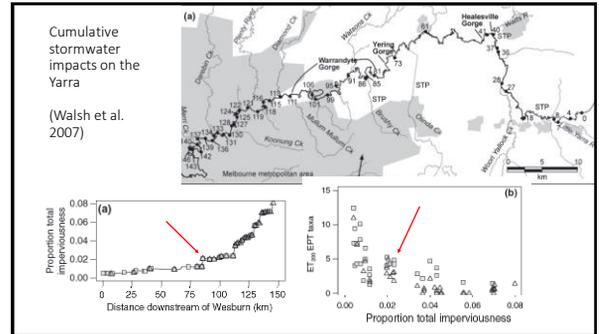
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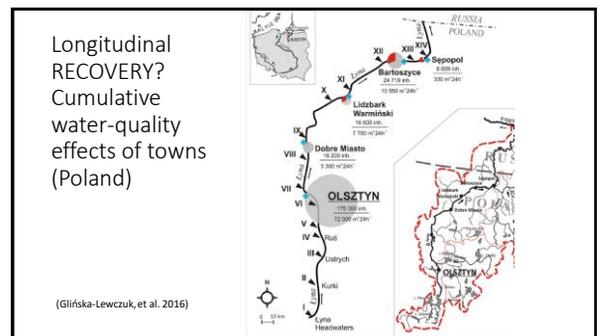
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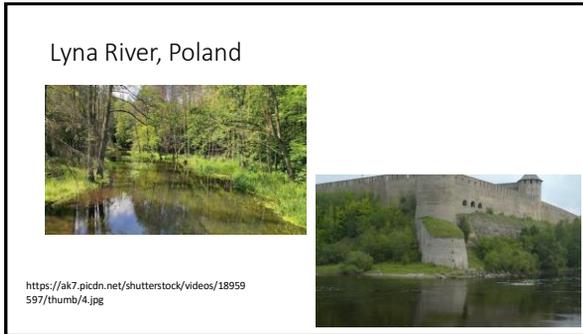
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- “Compared to a small stream with a more sudden boundary of urban land use along its catchment, the accumulation of stressors associated with urbanisation along the Yarra River may diminish the potential for colonisation of sensitive taxa drifting from less disturbed reaches upstream. A gradual accumulation may also diminish the potential for stream processes to improve water quality downstream of an urban input”
- Walsh et al. 2007

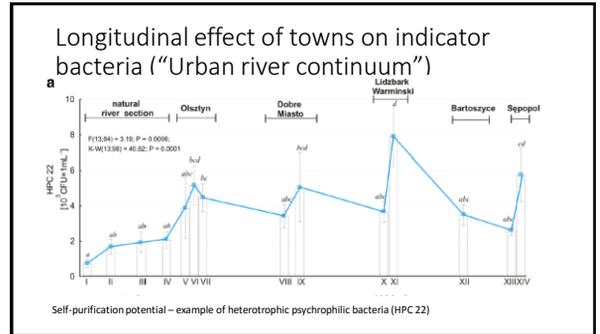
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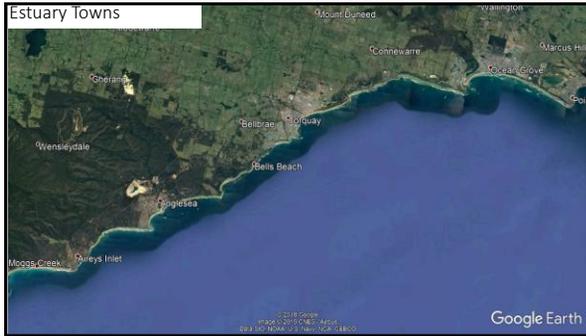
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## Conclusions

- Don't forget the impact of towns on waterways
- Very different problem from big city stormwater problem
- Upstream, downstream, local effects
- Cumulative effects
- All towns are different but can be roughly classified
- Good time to think about policy implications?

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## What next?

- Basic inventory of streams and towns
- Identify high value streams clearly at risk from towns (few?)
- Some basic research on impacts (may be modest!?)
- Think about policy implications
- State Environmental Protection Policy
- New EPA legislation?
- New urban stormwater Best Practice Environmental Management guidelines (BPEM)?

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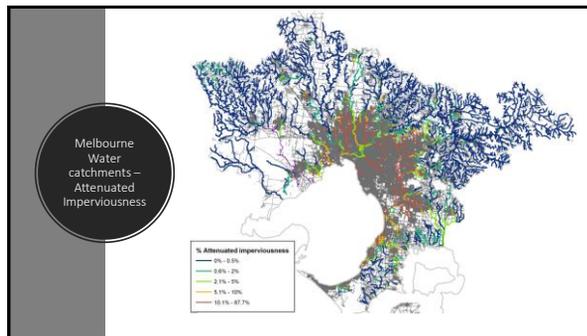
### References

- Glińska-Lewczuk, K., Golaś, I., Koc, J., Gotkowska-Plachta, A., Harnisz, M., & Rochwerger, A. (2016). The impact of urban areas on the water quality gradient along a lowland river. *Environmental monitoring and assessment*, 188(11), 624.

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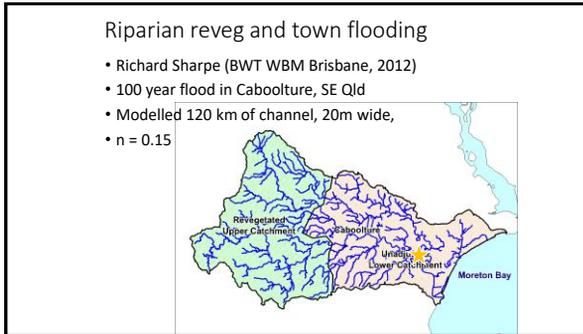
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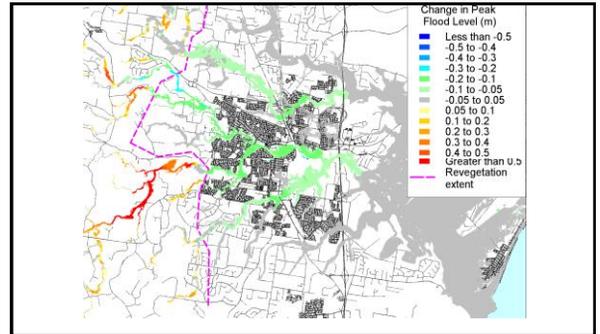
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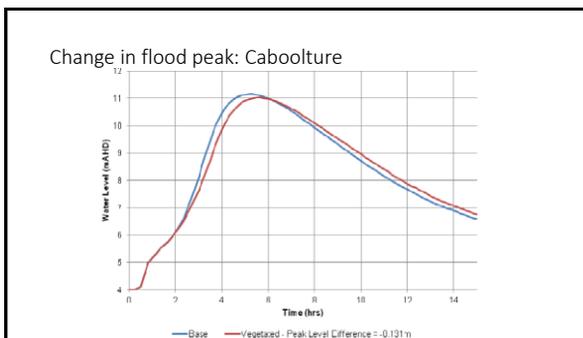
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