

Ensuring Healthy Waters under Pressures of Growth

Tom Porter & Katja Huls

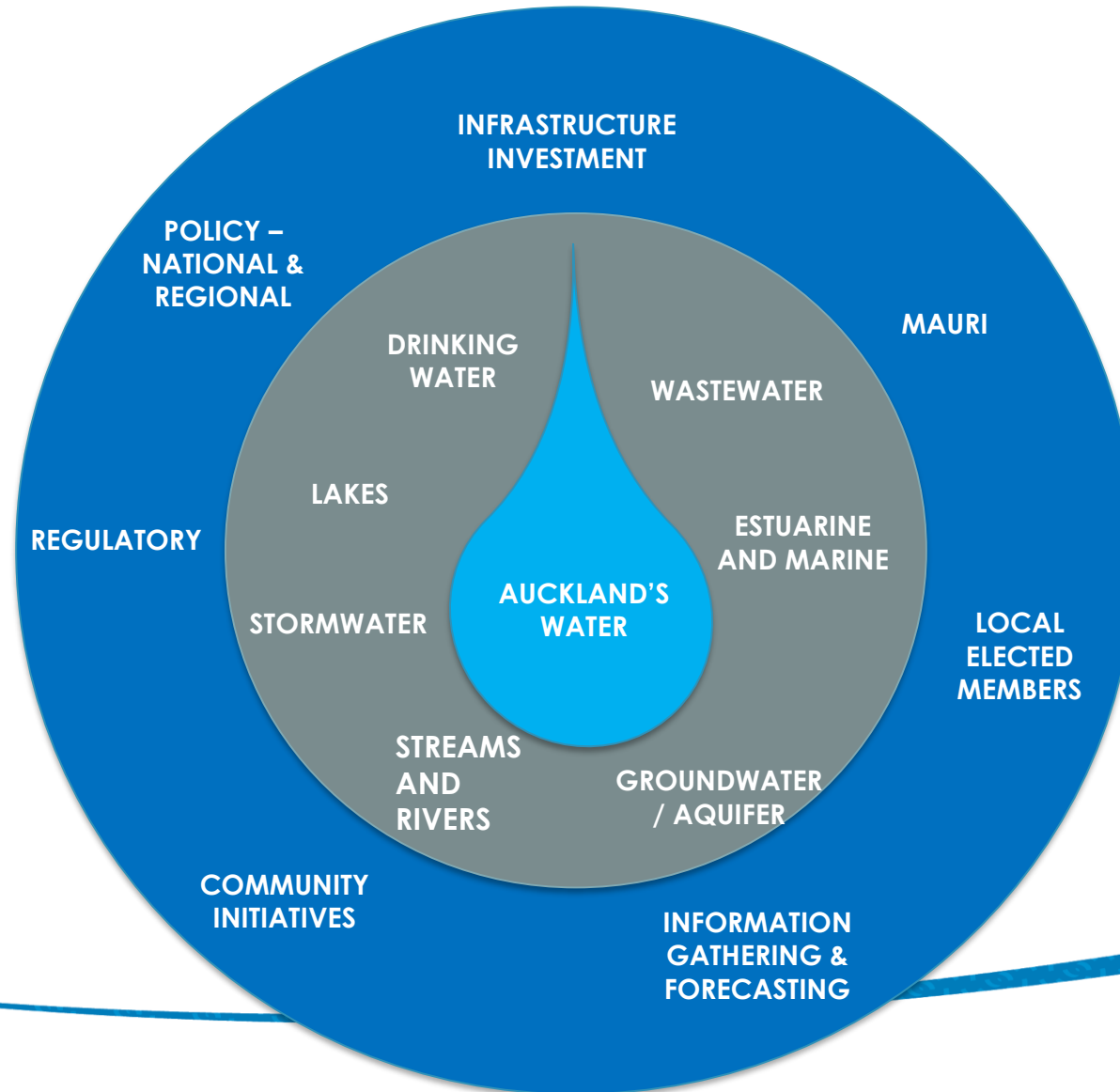
Healthy Waters, Auckland Council 4 April 2019

Aim of this presentation

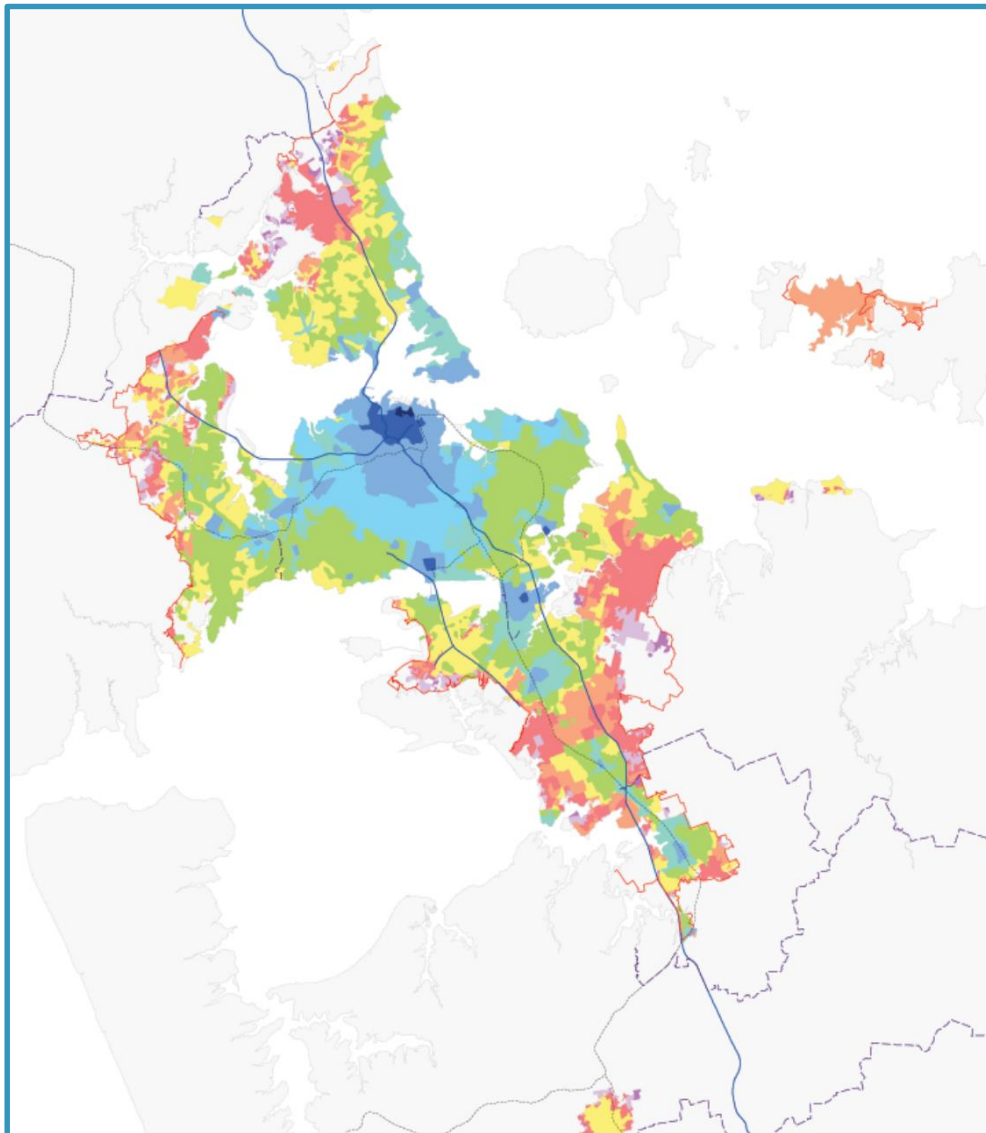
- Background to water quality pressures
- How planning rules do (and don't) help protect the water environment
- Provide recommendations



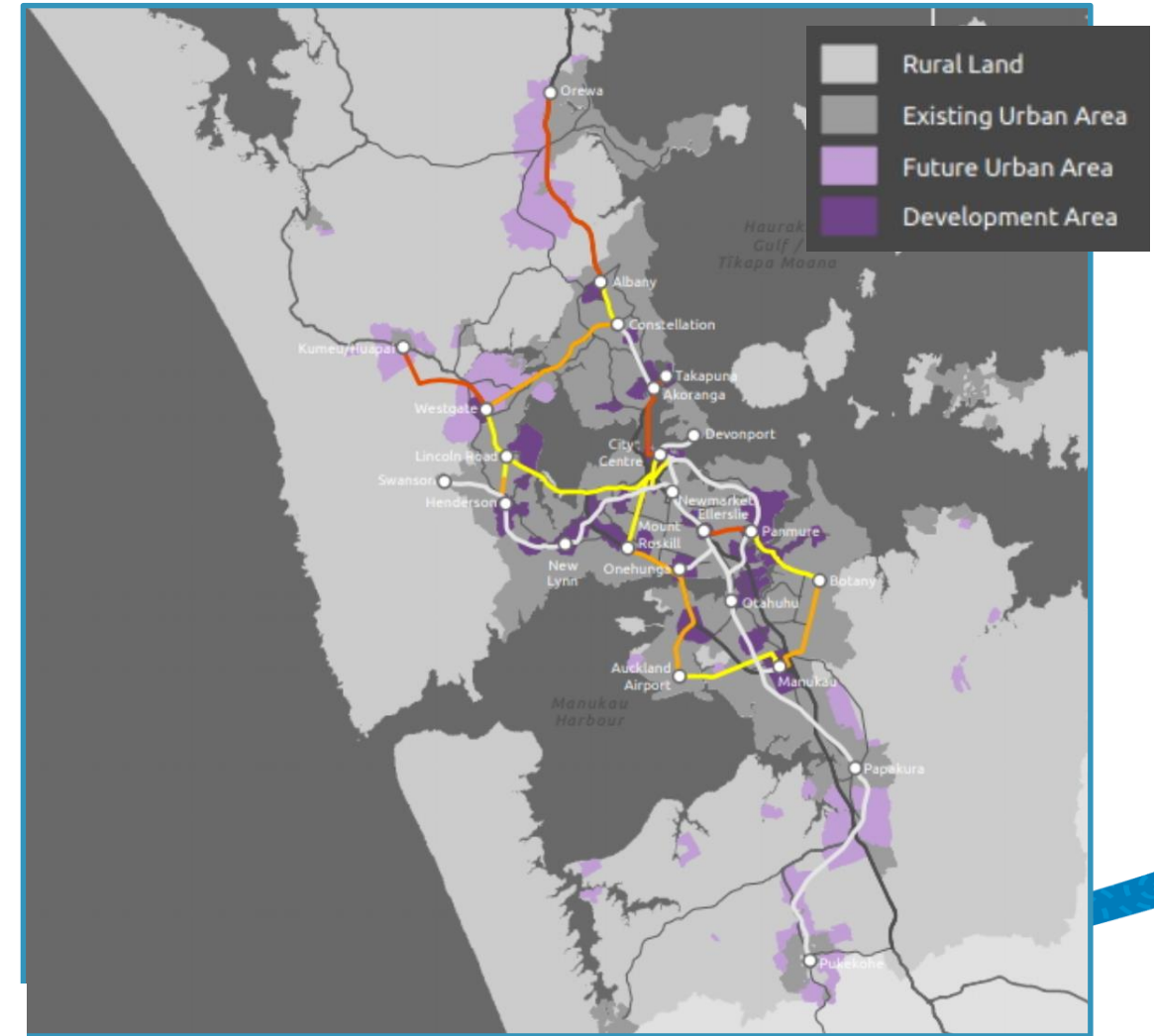
Complexity of water management



Auckland growth to 2018



Historic Urbanisation 1842 - 2008 Auckland Region



How development affects the water cycle

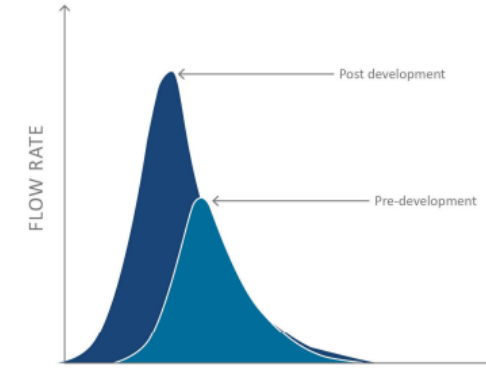
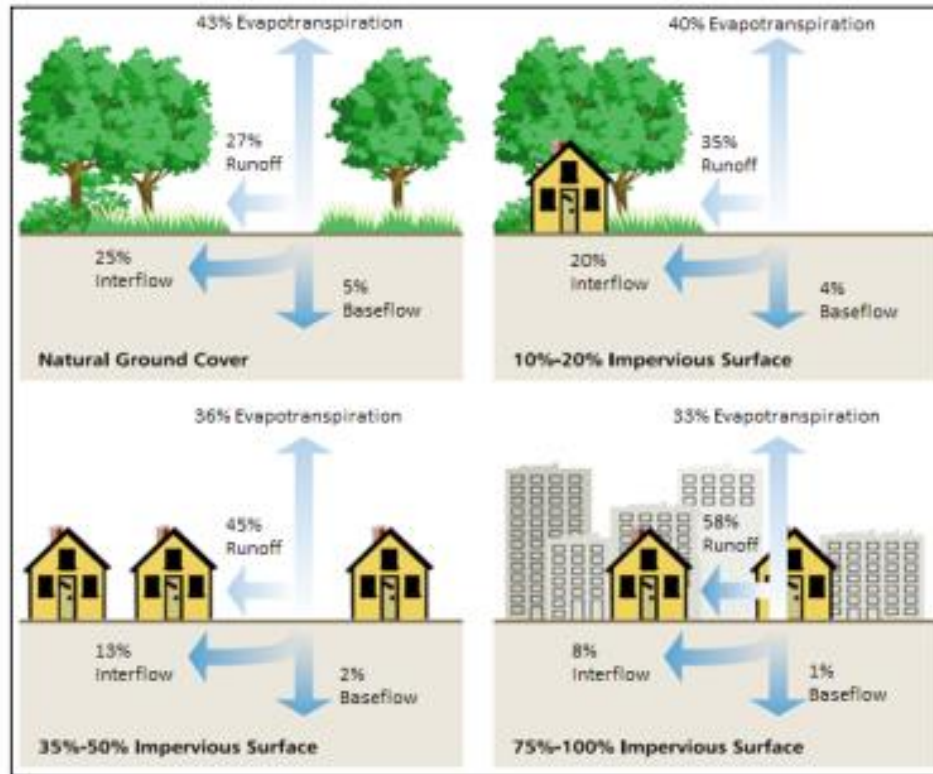


Figure 7: Example pre & post-development hydrographs for uncontrolled conditions (adapted from Shaver, 2000)

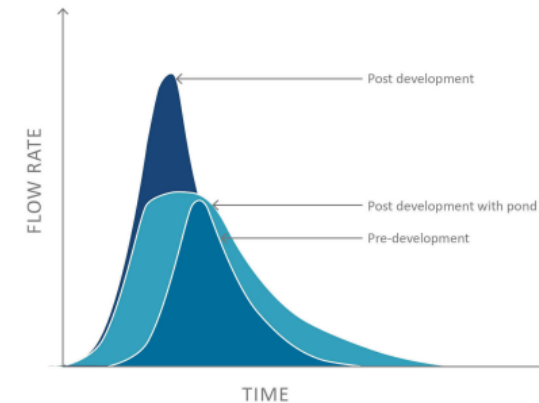


Figure 8: Typical post-development hydrograph with detention (adapted from Shaver, 2000)

The problem



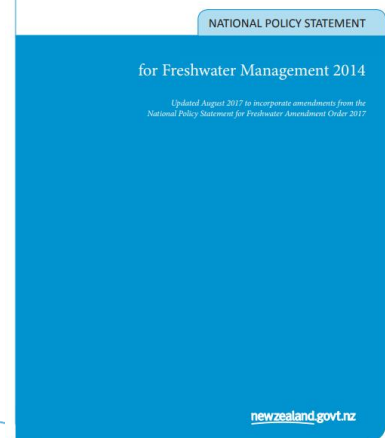
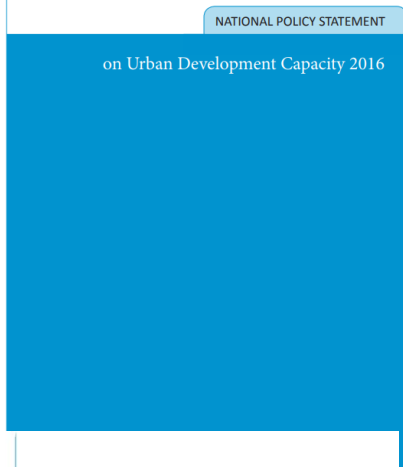
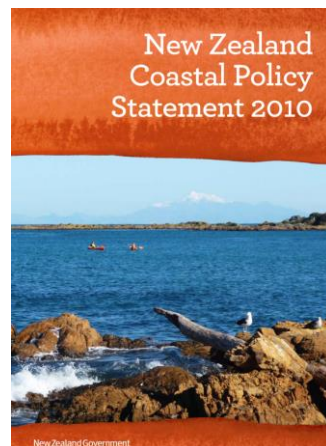


Sources



Pressures

- Growth
- Legislation
- Increased public scrutiny



Legislative Framework

Local Government Act

Funding

Sustainable development:

- social, economic and cultural interests
- maintain and enhance the quality of the environment
- reasonably foreseeable needs of future generations

Good quality network infrastructure

- Efficient
- effective
- appropriate for present and anticipated future circumstances

Cost effective regulation

Resource Management Act

Sustaining the potential of natural and physical **resources** to meet the reasonably foreseeable needs of future generations

Safeguarding the life-supporting capacity of air, water, soil and ecosystems

Avoiding, remedying or mitigating any adverse effects of activities on the environment

Building Act

Regulation of building work

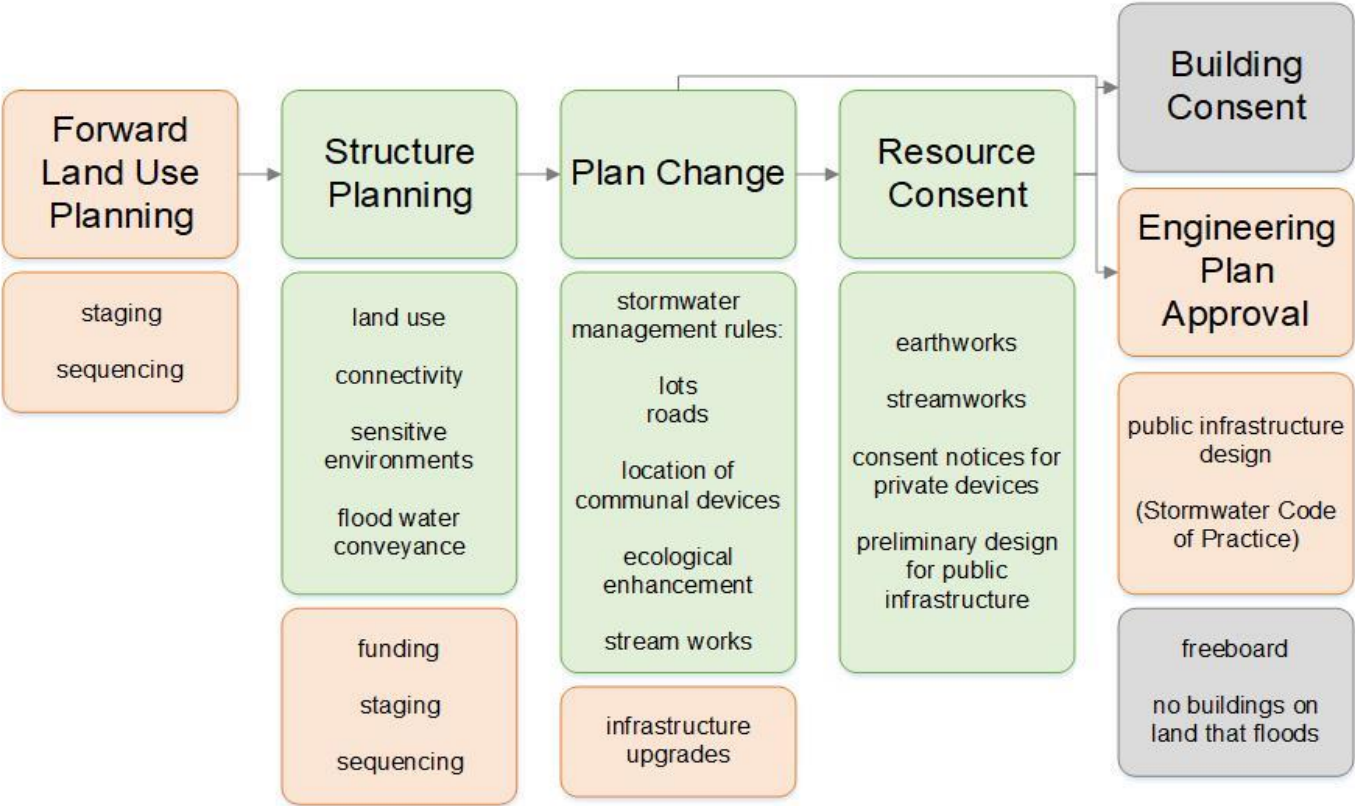
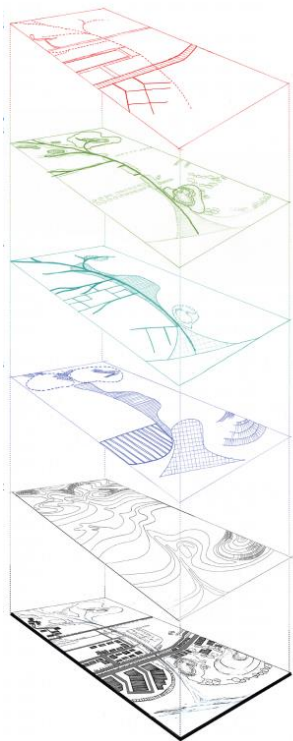
A licensing regime for building practitioners

Setting of performance standards for buildings to ensure:

- safety
- contribute to health and well-being
- escape from building fires
- buildings are designed, constructed, and able to be used in ways that **promote sustainable development**

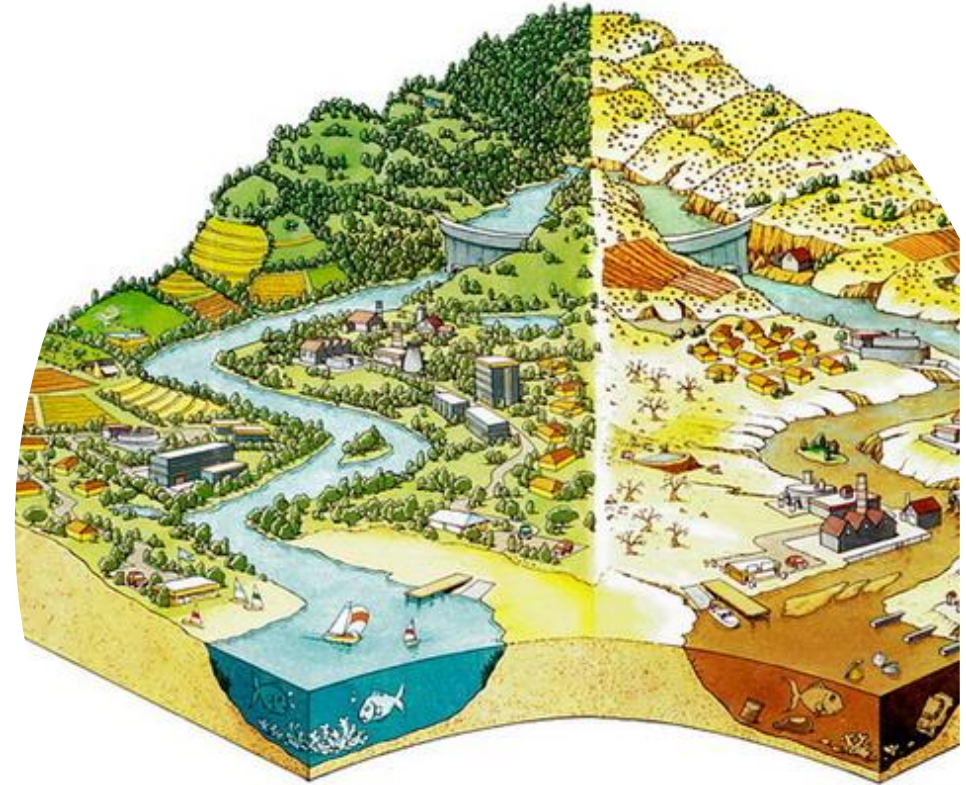
Building code compliance

Water Sensitive Design Framework



Understanding the issues

- Which contaminants
- Strategic
- Scale
- Identifying sources
- Monitoring and modelling



Using models to implement BMPs

	Contaminant Generation	Contaminant behaviour	Current Interventions	Opportunities for intervention	Ground truthing	Planned interventions
Land Use	Land Use	Flow routing and hydrology		Change land use (zoning)	Calibrate model with monitoring data	Plan changes
Activities	Activities e.g. vehicle movements	Physical processes	Existing devices	Activities Private Public e.g. planting Retrofitting devices	Verification of device feasibility e.g. is there space	Environmental state scenarios linked to LTP cost scenarios
Model	Loading Simulation Programme		U.S. EPA open source SUSTAIN		Calibrate LSPC	SUSTAIN Insert new approaches to improve water quality predictions

2017

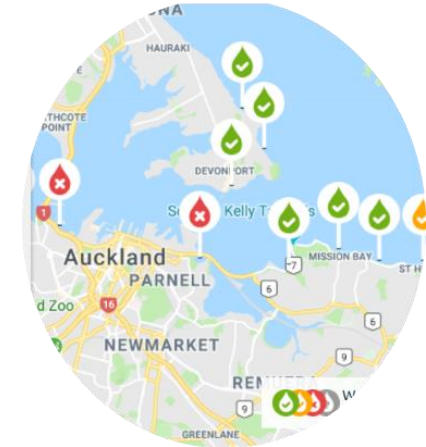
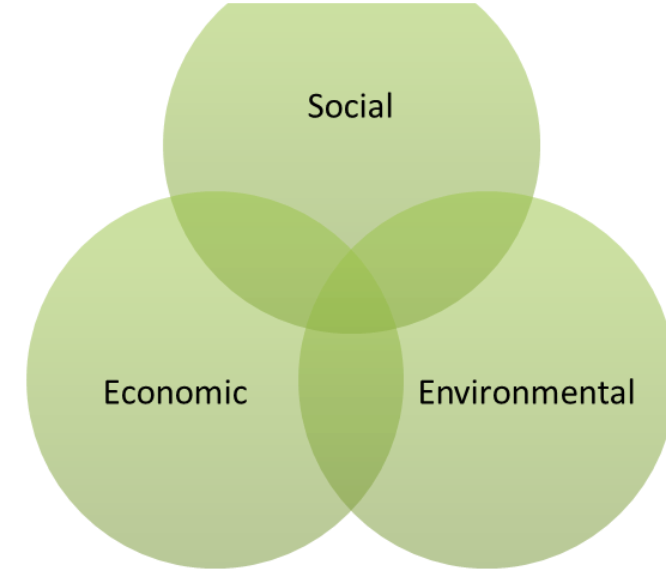
Present

2019

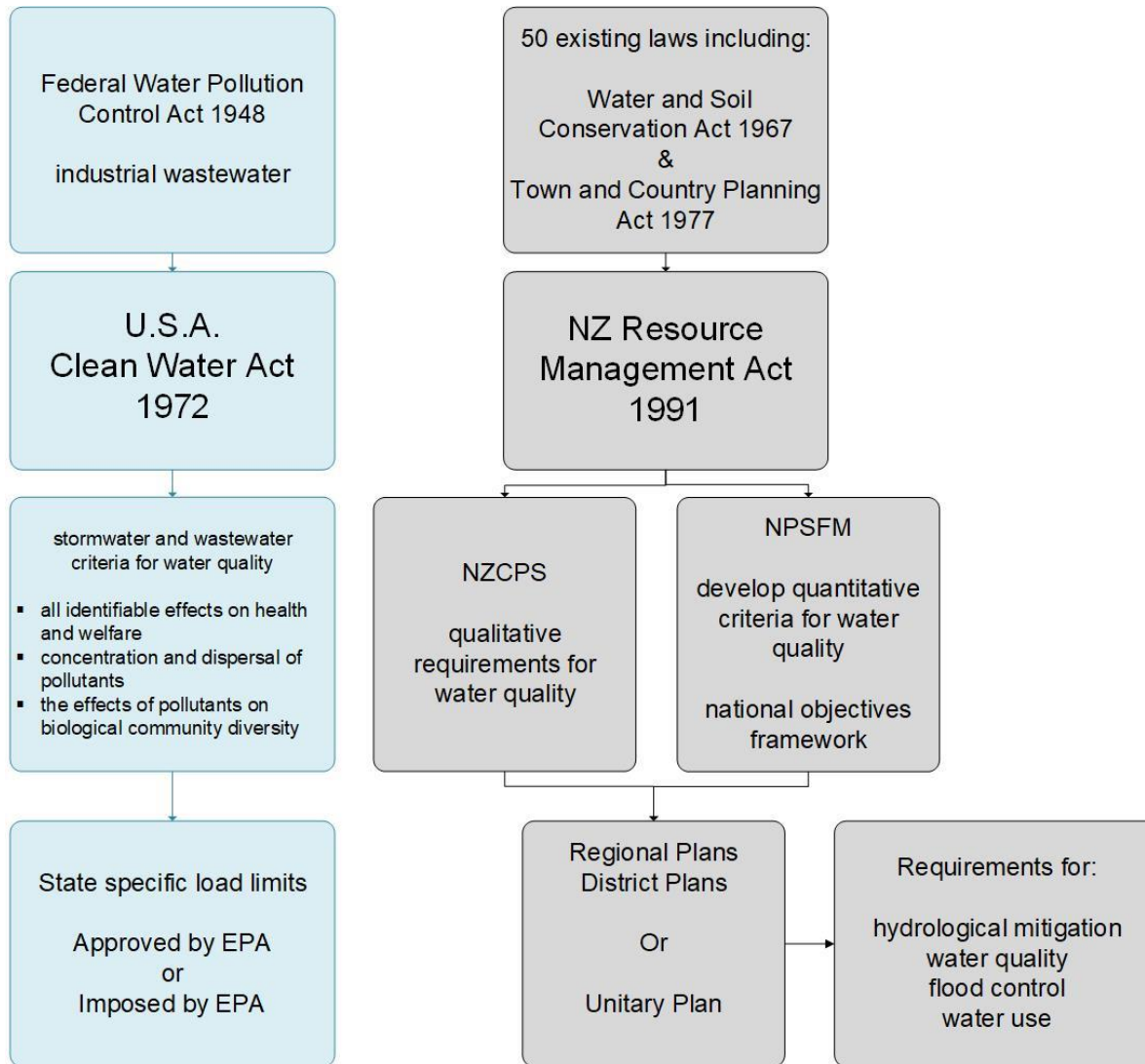
2020

Identifying which solutions

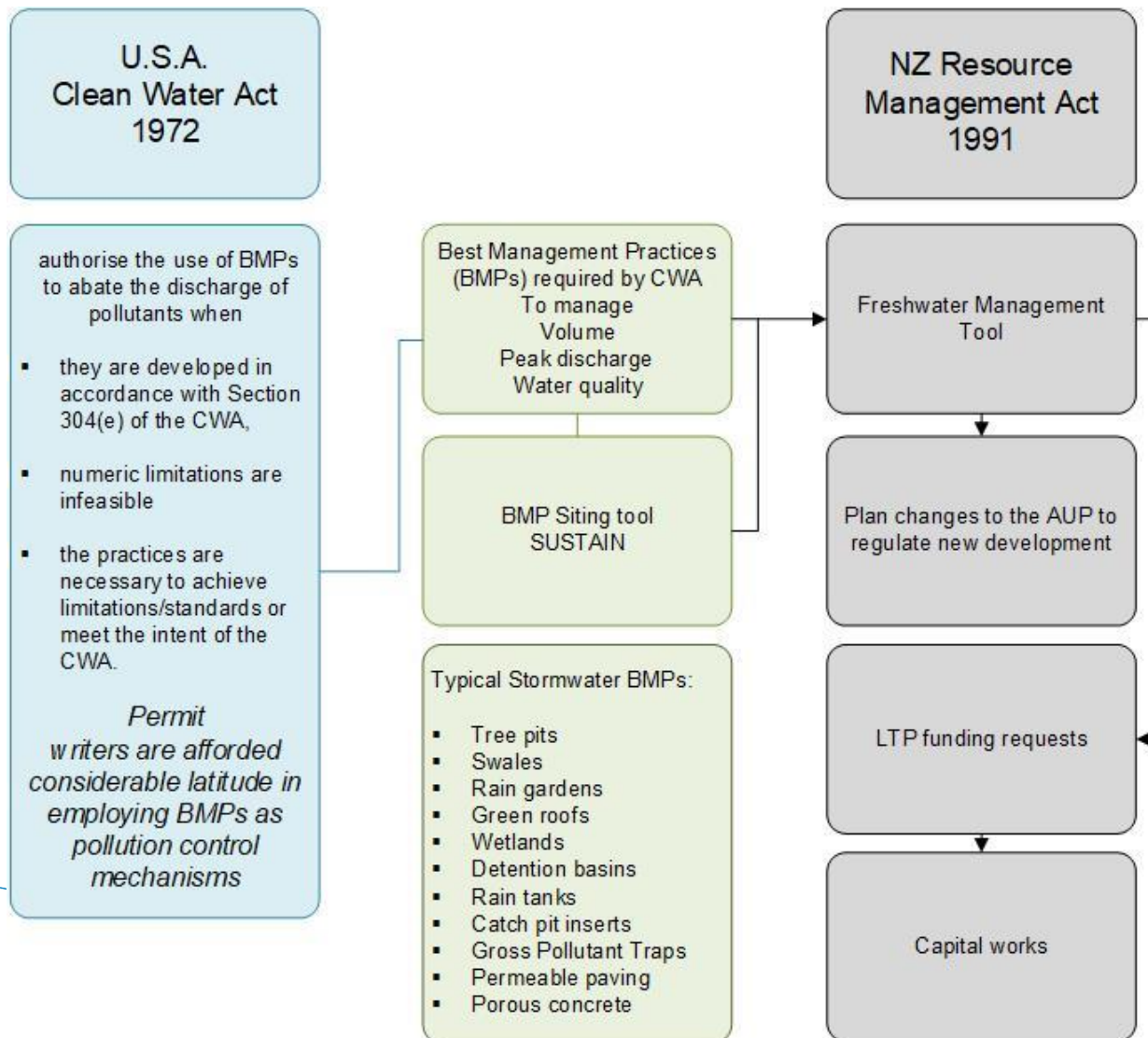
- Targeted
- Strategic
- Holistic
- Structural or non-structural
- Catchment
- Cost-effective



Stormwater Management Best Practices



Best Management Practices (BMPs)



Chesapeake Bay “pollution diet”

1930s

Dead zone first reported

Between 2014 and 2015

nitrogen loads fell 25 %

Phosphorus loads fell 44 %

Sediment loads fell 59 %

2017

- 40% of bay water up to EPA standards
- 91,000 acres of underwater grasses – the highest amount ever recorded
- Blue crab population increased from 297M to 553M
- Striped bass population stabilised
- Oyster harvests increased

Water quality considerations for new development



Over the course of two years the entire peninsula is earth-worked.

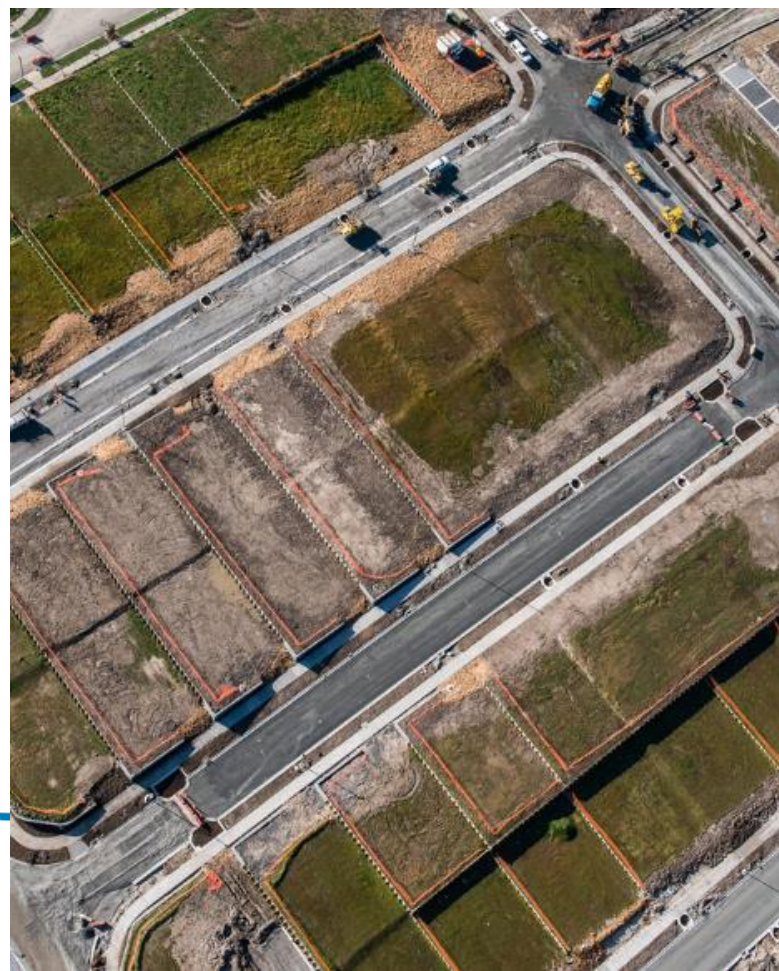
Large extents of impervious surfaces are being introduced





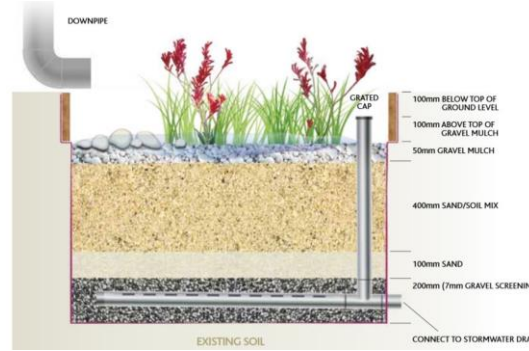
Water quality considerations for new development

Redevelopment of
Hobsonville and Whenuapai



Communal devices





Private devices

Ensure resource consents consider future maintenance obligations





Te Auaunga Awa

Benefits of green design

- Projects can cost less
- Health and social
- Economic
- Environmental resilience
- Opportunity for New Zealand to become world leaders



Making sure Water sensitive design works!!

- Location
- Design
- Maintenance
- In combination (treatment train)



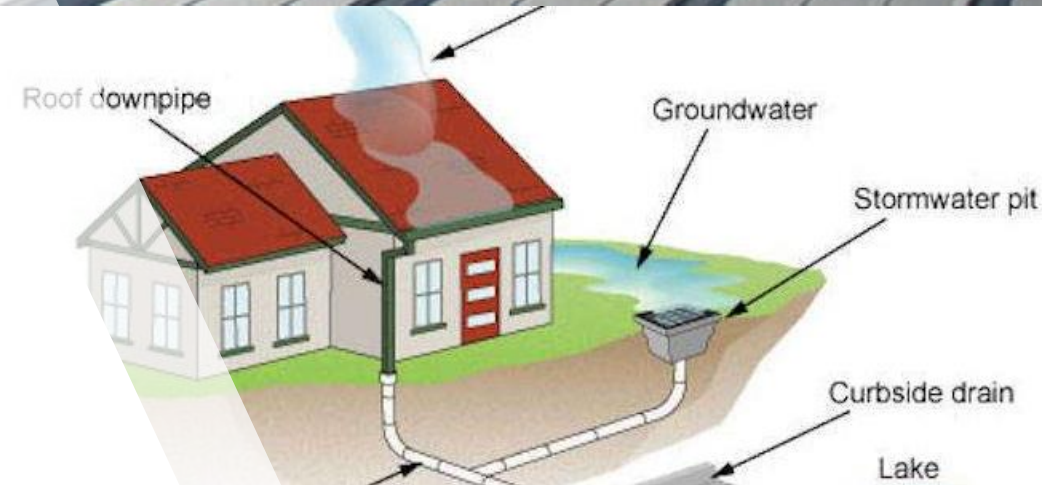


Earthworks

- Mass landform change is undertaken
- Key premise of WSD is minimising soil disturbance
- Small sites produce significant run-off that discharges to treatment devices and imposes maintenance cost to the ratepayer
- Changes in ground level of up to 0.5m is managed purely by common law
Flooding of new slab on grade dwellings can occur

Recommendations

- Consider whether impervious surfaces connected directly to the receiving environment
- Look for opportunities to keep natural channels and use green spaces to convey (and treat) flows
- Share learnings throughout industry
- Include environmental value of schemes within business cases
- Whole catchment approach
- Consider maintenance, ownership and lifespan
- Utilise public interest in schemes to lead to behaviour change



Conclusions

- Significant challenges to ensure healthy environments
- Collaboration and sharing ideas is key
- Opportunities to create legacy
- New Zealand is under scrutiny for its green image
- Effective and sympathetic planning can lead to a healthy environment for all





La Rosa Garden reserve, Auckland *picture courtesy National Geographic*

Thank you.

Questions? Comments?

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BE THE HOW.
WHAKAMAUA KIA TINA!