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Symposium

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Stormwater Management and the NPS for Freshwater Management 2014

EIANZ Symposium, 27 March 2015
Presented by Nicki Green



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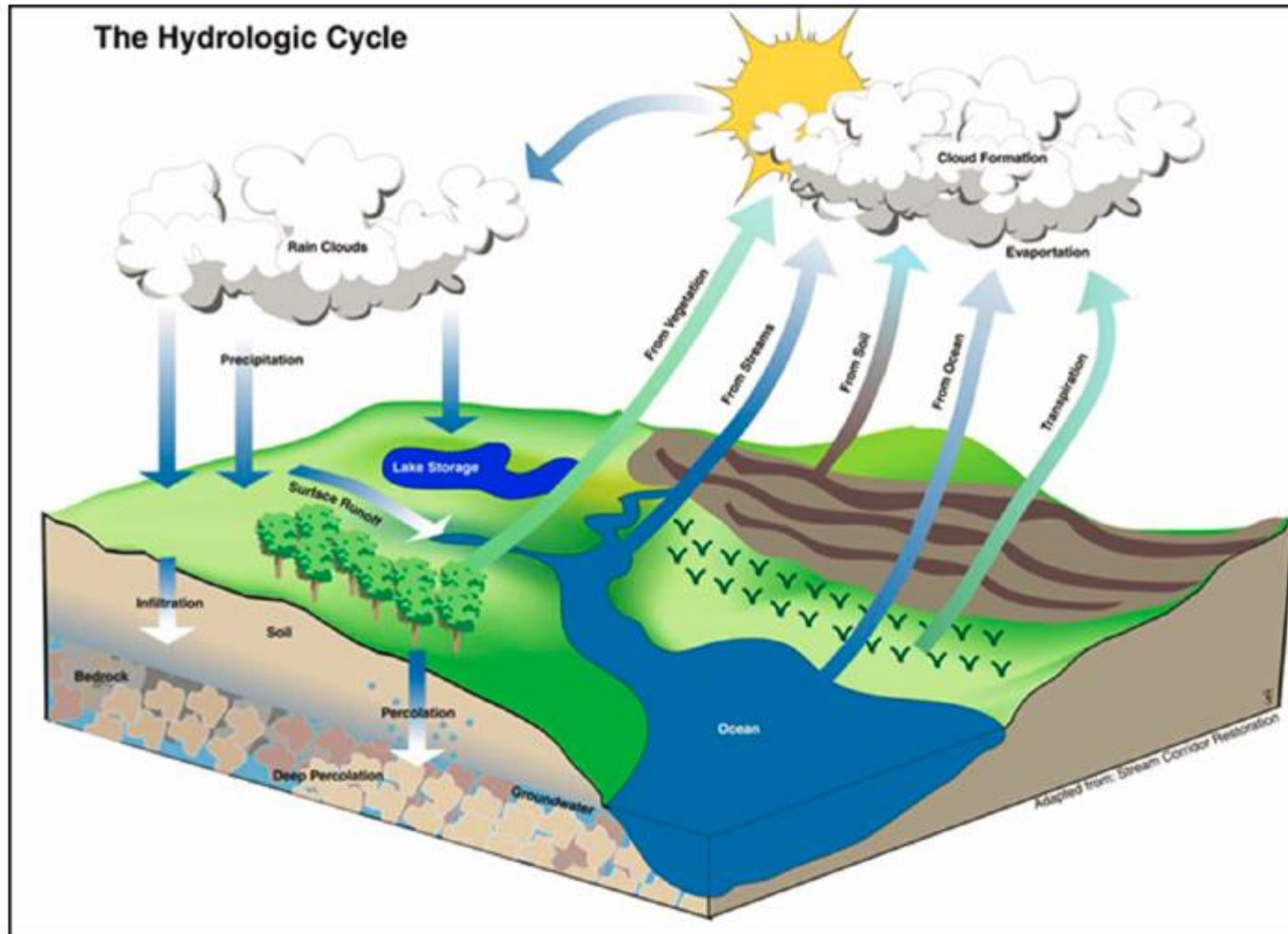
Introduction

1. Urbanisation and stormwater runoff
 - What are the effects we need to manage?
2. NPS Freshwater Management 2014 direction
3. Implementation
4. Proposed Auckland Unitary Plan

1. Urbanisation



Hydrological Cycle



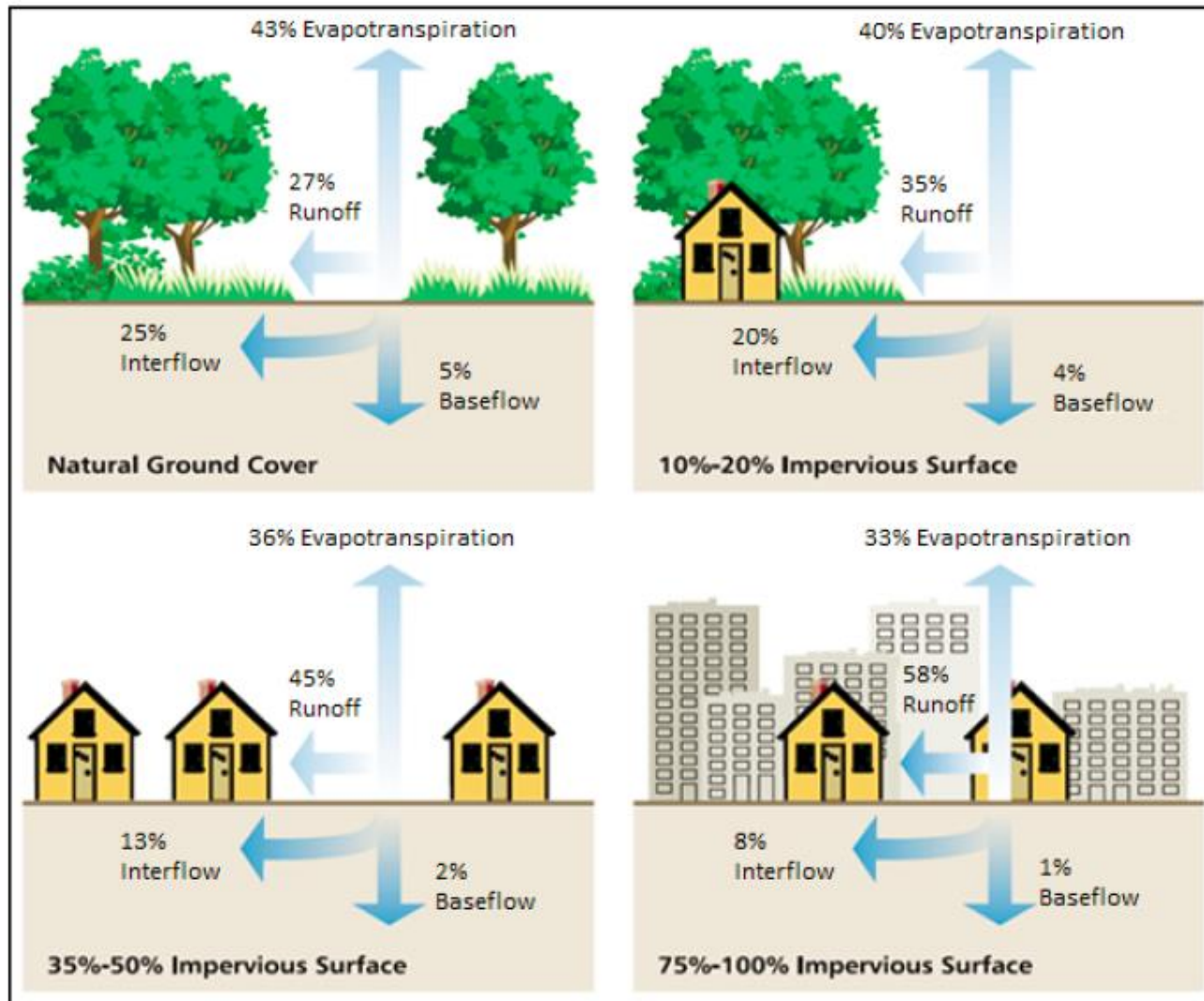
Urban Development

- Fill/channelise streams and flood plains
- Create imperviousness
 - buildings, roads, paving
- Direct runoff to pipes and point discharges
- Generate stormwater contaminants
 - vehicles, building materials etc
 - heavy metals, sediment, increase temperature
 - wastewater overflows



Photos sourced from presentation by Dr Martin Neale

Imperviousness and Hydrology



Reference: Prince Georges County Department of Environmental Resources 1999

Stormwater Runoff – Volume and Peak

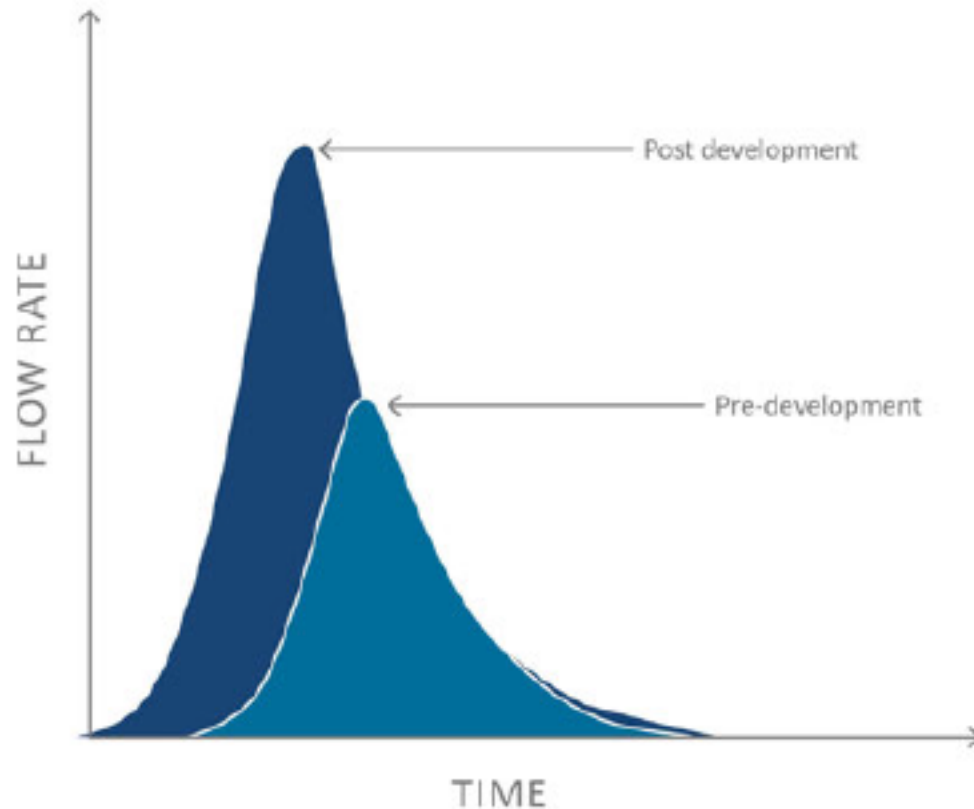
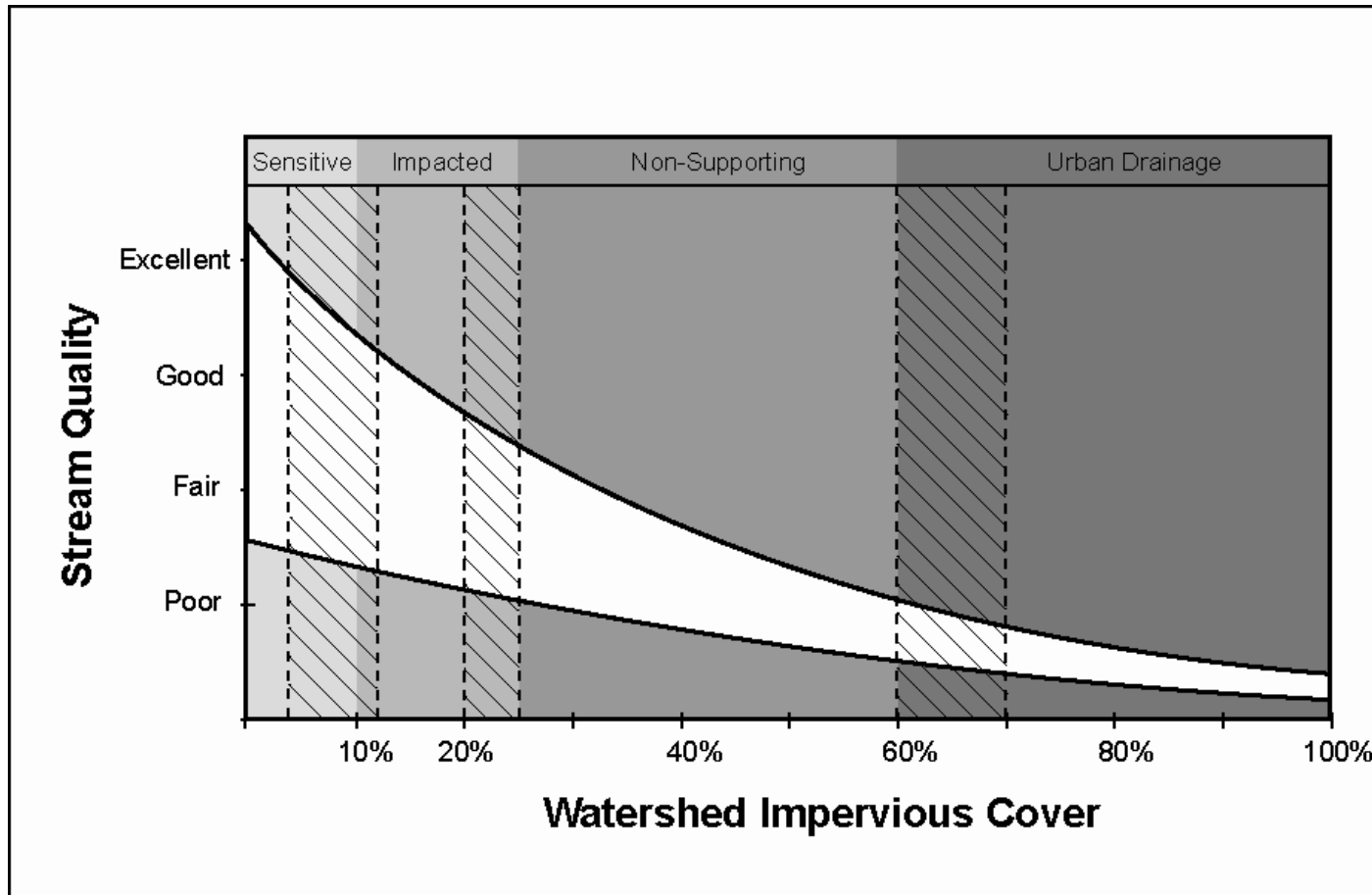


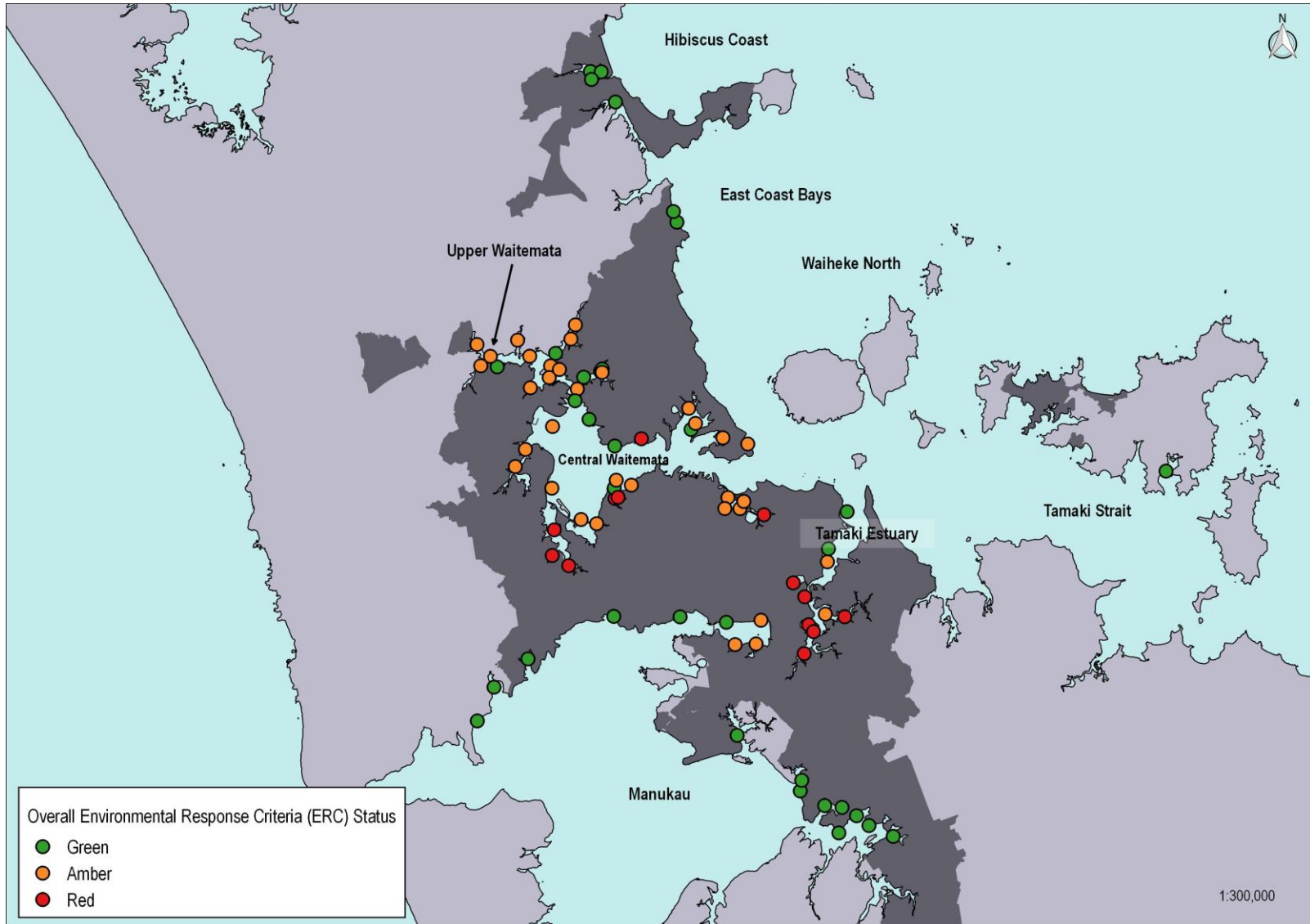
Figure 5: Typical pre and post development hydrographs for uncontrolled conditions (adapted from Shaver et al. 2000)

Effects – Flow

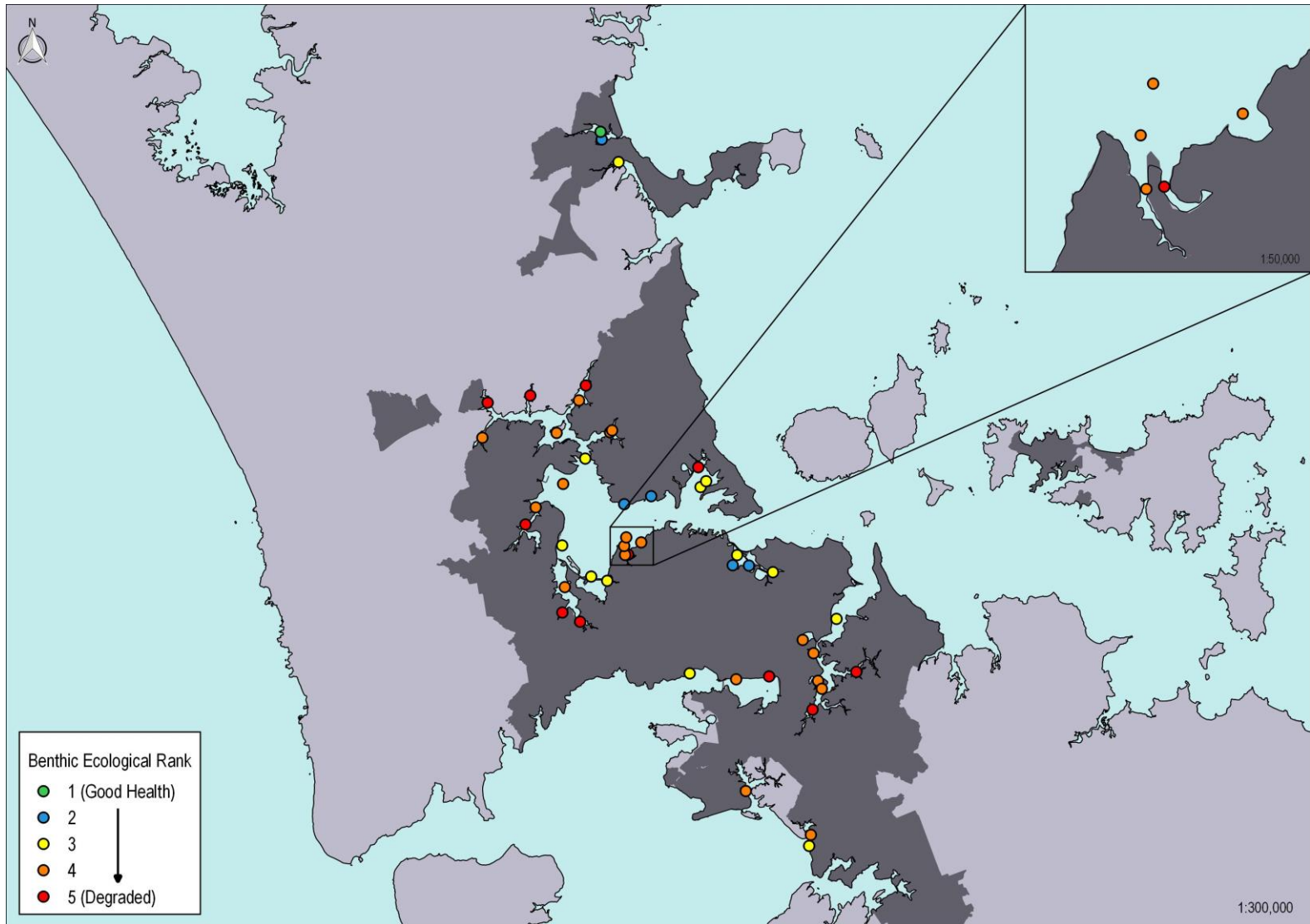


Source: CSN (2008). Chesapeake Stormwater Network (CSN) Technical Bulletin No. 3, Implications of the Impervious Cover Model: Stream Classification, Urban Subwatershed Management and Permitting, Version 1.0, 2008, USA.

Effects - Contaminants



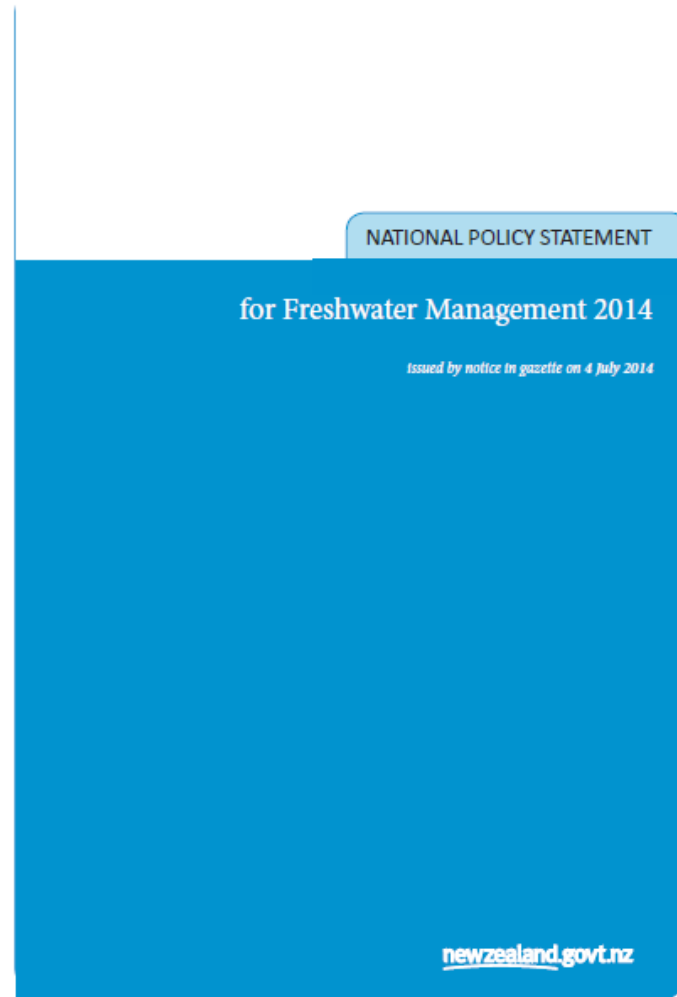
Effects - Contaminants



Urbanisation and Stormwater Runoff

- Stream loss
- Degraded stream health and erosion
 - flow volume and peak
 - less base flow
- Degraded coastal water quality and ecology
 - contaminants
- Flooding and nuisance
- “Irreversibility”
 - urbanisation (multiple owners) and infrastructure dependence

2. National Policy Statement



National Policy Statement

- Stream loss
 - Silent and National Objectives Framework doesn't apply
- Stream health
 - Objectives A1 and B1: safeguard life supporting capacity, ecosystem processes, indigenous ecosystems
 - NOF: ecosystem health a compulsory value but current attributes are not the most relevant for urban stream health
 - Additional values: don't include conveyance
 - Water quantity: environmental flows to be identified, but no comment on other flow effects

National Policy Statement

- Integrated management
 - Freshwater and use and development of land
 - Interactions with the coastal environment
 - Cumulative effects

National Policy Statement

- “Irreversibility”
 - establish objectives etc in consideration of implications for resource users, timeframes, etc (Policy CA1)
 - control on discharges to achieve the objectives and limits, but also envisages use of BPO (Policy A3)
 - can set objectives below national bottom lines if this is the naturally occurring state or if specified infrastructure contributes to the state (Policy CA3)

NZ Coastal Policy Statement

...take steps to avoid adverse effects of stormwater discharge to water in the coastal environment, on a catchment by catchment basis, by:

- a. avoiding where practicable and otherwise remedying cross contamination of sewage and stormwater systems;
- b. reducing contaminant and sediment loadings in stormwater at source, through contaminant treatment and by controls on land use activities;
- c. promoting integrated management of catchments and stormwater networks; and
- d. promoting design options that reduce flows to stormwater reticulation systems at source.

3. Implementation in Auckland

- Both NPSFM and NZCPS – integrated approach
- Recognise the limitations of the NOF
 - Meeting the National Bottom Lines will not equate to good urban stream health
- Address stream loss
- Attributes and objectives for hydrology for stream health
 - catchment peak and volume management
- Coastal receiving environment objectives influence freshwater objectives
 - heavy metals and sediment

Implementation

- Manage the cause, as well as discharges
 - land use and development (multifaceted approach)
 - may require regional and district functions
- Recognise constraints
 - long time frames (land use change, infrastructure replacement)
 - BPO for network discharges within context of objectives framework

4. Proposed Auckland Unitary Plan

- Water Sensitive Design for greenfields/comprehensive development
 - structure planning, subdivision, green infrastructure
- Regional land use controls
 - to manage peak and volume for streams most sensitive to flows
 - to manage contaminants from larger sources
- Discharge rules
 - BPO for networks
- Approach is yet to be “married” with management objectives framework

Conclusion

- Implementation - broader than the NPSFM framework
- Auckland will need to develop relevant values, attributes and objectives for urban streams
- Address key causes of effects on stream health
- Apply a tool box of methods, with a strong focus on managing land use and development

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