Upper Harbour Local Board
Auckland Council

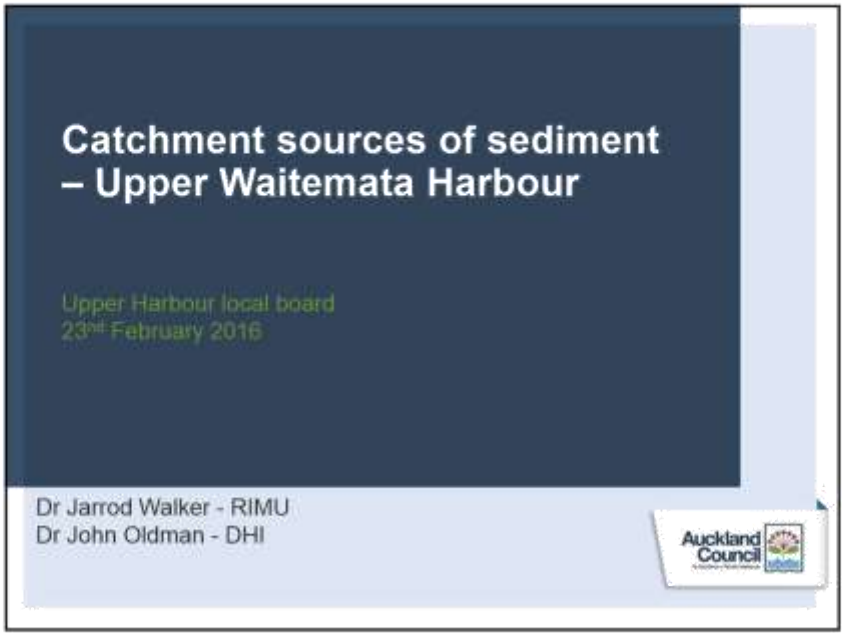
**Date:** Tuesday 23 February 2016
**Time:** 7.00pm
**Meeting Room:** Upper Harbour Local Board Office
**Venue:** 30 Kell Drive
Albany

# Upper Harbour Local Board

# OPEN MINUTE ITEM ATTACHMENTS



**Note:** The attachments contained within this document are for consideration and should not be construed as Council policy unless and until adopted. Should Councillors require further information relating to any reports, please contact the relevant manager, Chairperson or Deputy Chairperson.


Catchment sources of sediment
– Upper Waitemata Harbour
Upper Harbour local board
23rd February 2016
Dr Jarrod Walker - RIMU
Dr John Oldman - DHI
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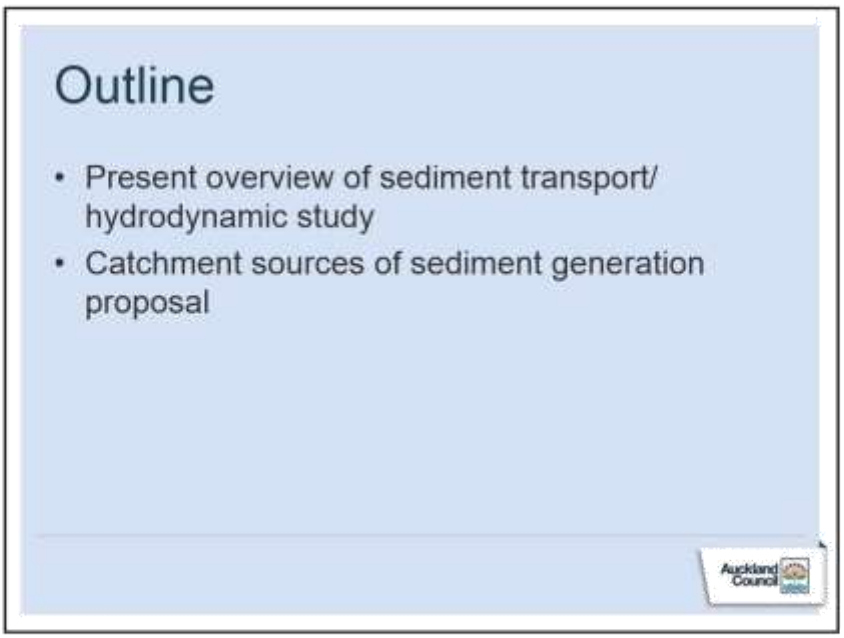
Outline
• Present overview of sediment transport/ hydrodynamic study
• Catchment sources of sediment generation proposal
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Attachment A

## Background

- Funding options presented to the board
- Modelling of sediment loads
  - Engaged with DHI
- Presented sediment transport model to the board
- Identify areas to control sediment in the catchment

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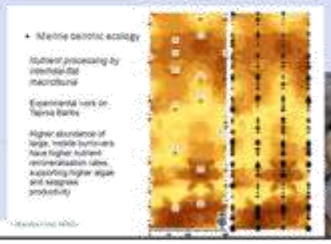
## Sediment – major issue

- Impact; filter feeders, visual acuity, light -> benthic communities
- Marine water quality – elevated sediment + nutrients -> low $O_2$
- Ecology – Poorest health near tidal creeks



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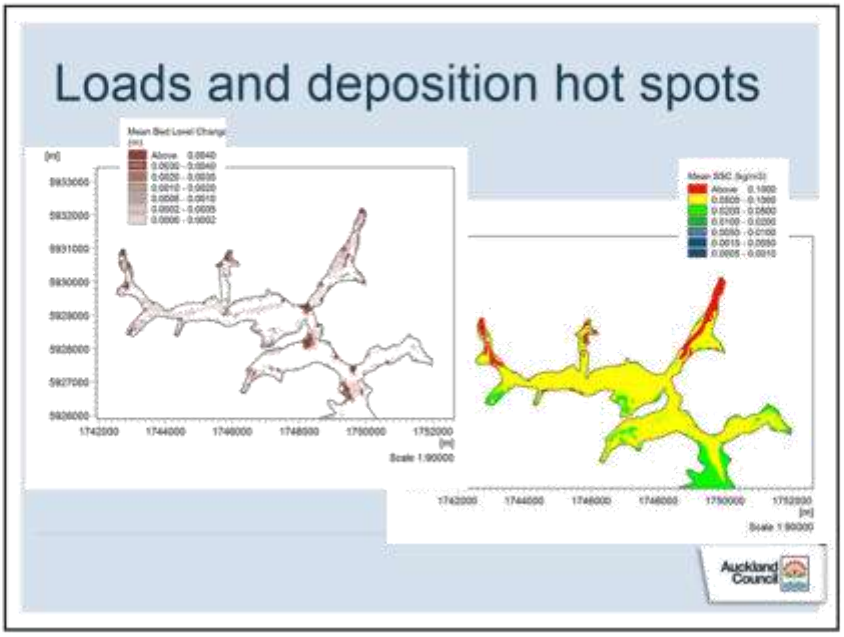
Loads and deposition hot spots
Mean Bed Level Change (m)
Above 0.0040
0.0030 - 0.0040
0.0020 - 0.0030
0.0010 - 0.0020
0.0005 - 0.0010
0.0002 - 0.0005
0.0000 - 0.0002
[m]
5933000
5932000
5931000
5930000
5929000
5928000
5927000
5926000
1742000
1744000
1746000
1748000
1750000
1752000
[m]
Scale 1:90000
Mean SSC (kg/m3)
Above 0.1000
0.0500 - 0.1000
0.0200 - 0.0500
0.0100 - 0.0200
0.0050 - 0.0100
0.0015 - 0.0050
0.0005 - 0.0010
1742000
1744000
1746000
1748000
1750000
1752000
[m]
Scale 1:90000
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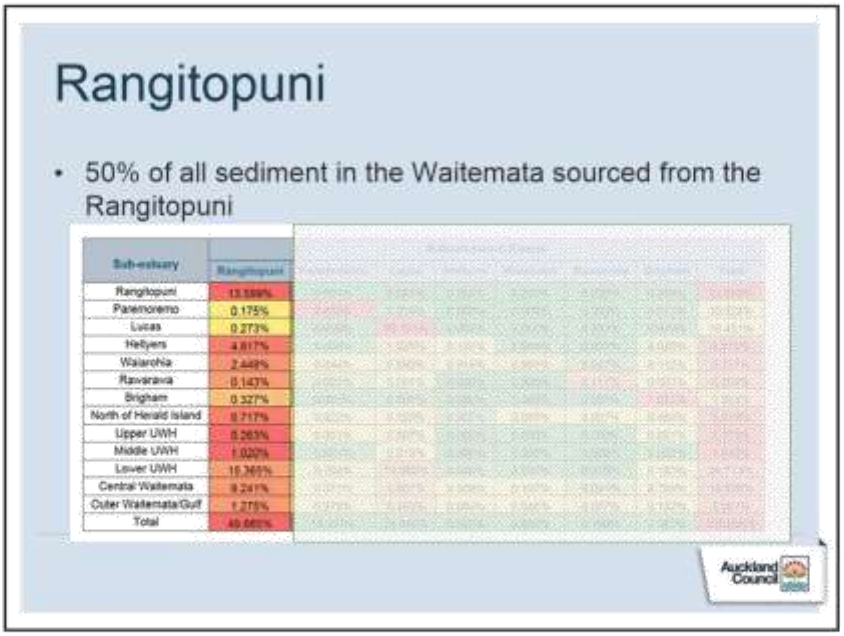
Rangitopuni
• 50% of all sediment in the Waitemata sourced from the Rangitopuni
Sub-estuary
Rangitopuni
Rangitopuni 13.589%
Paremoremo 0.175%
Lucas 0.273%
Hellyers 4.617%
Waiarohia 2.449%
Rawarawa 0.143%
Brigham 0.327%
North of Herald Island 0.717%
Upper UWH 0.283%
Middle UWH 1.020%
Lower UWH 15.265%
Central Waitemata 9.241%
Outer Waitemata/Gulf 1.275%
Total 49.665%
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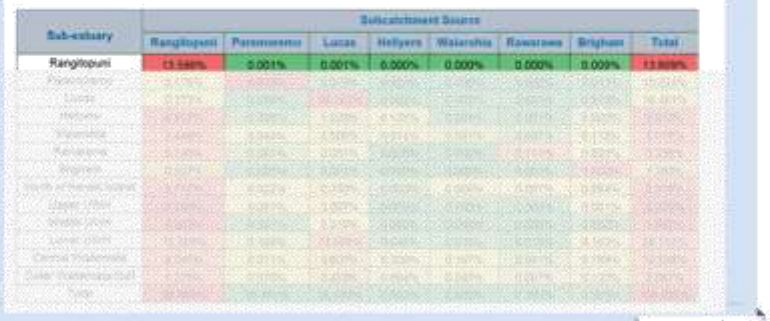
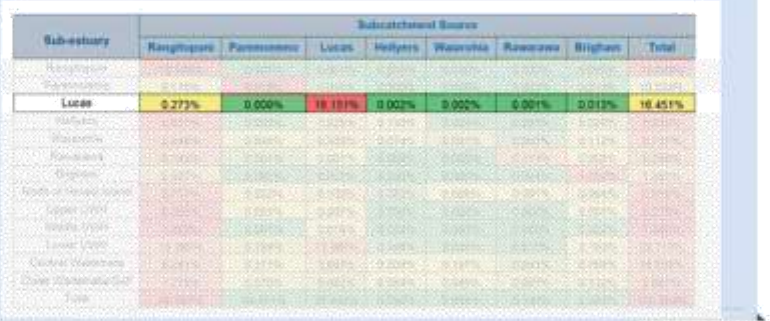
# Rangitopuni

- Almost all sediment in the Rangitopuni estuary is from the Rangitopuni catchment



# Lucas Creek

- Largely influenced by Lucas creek catchment



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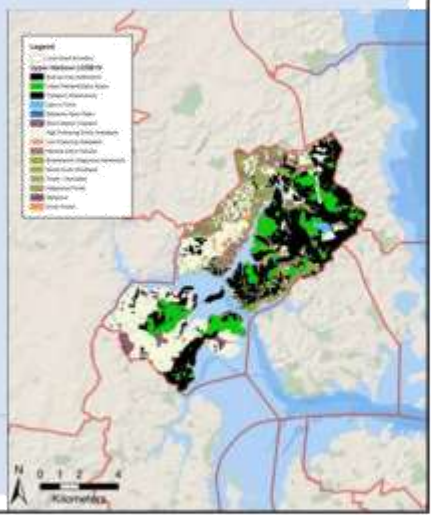
## Supply to larger Waitemata

- Upper Harbour contributes ~ 16% to central and outer Waitemata

| Sub-estuary | Subcatchment Source | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Rangitopuni | Paremoremo | Lucas | Hellyers | Waiarohia | Rawarawa | Brigham | Total |
| Central Waitemata | | | | | | | | 14.536% |
| Outer Waitemata/Gulf | | | | | | | | 2.067% |

## Land use

- Upper harbour LB
  - 28% pasture
  - 33% urban
  - 22.5% forest
    - 19.5% native
    - 3% exotic
  - 3% horticulture
  - 11% parkland



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## Sediment management

- Current tools
  - Fencing
  - Riparian planting
  - Stormwater devices (urban areas)
- Where exactly to do this?
  - A modelling exercise to determine where you will get best bang for buck

## Catchment sources of sediment

- Identify sediment generation in the surrounding catchment and how management actions may reduce sources of sediment
- Refine the existing catchment generation model for the Lucas catchment
- Provide quantification of changes in sediment delivery due management options relating to sediment control within the Lucas catchment
- Quantifying areas of changes in deposition within the harbour that can be attributed to the options being considered.
- Provide robust guidance on where concentrate your sediment control efforts

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- Example already applied to the Kaukapakapa catchment

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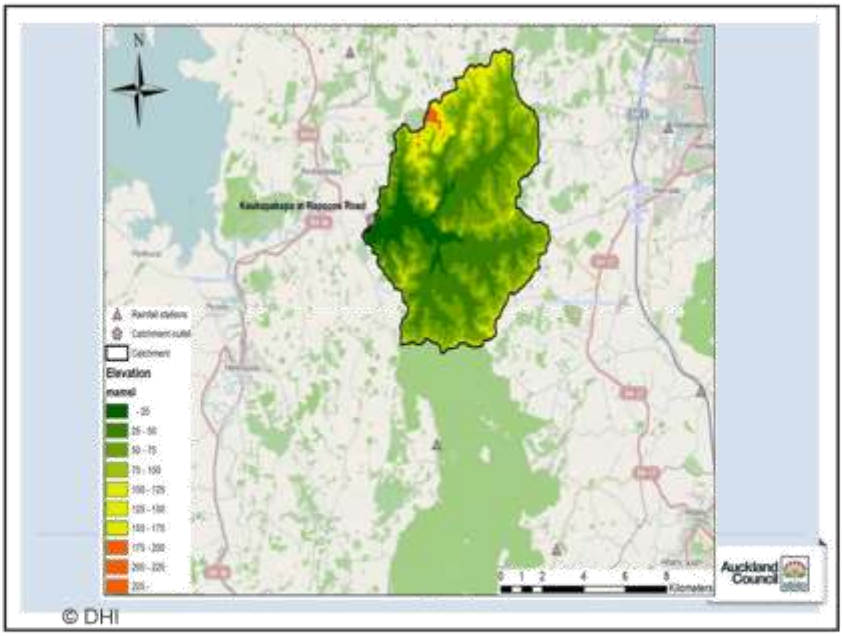


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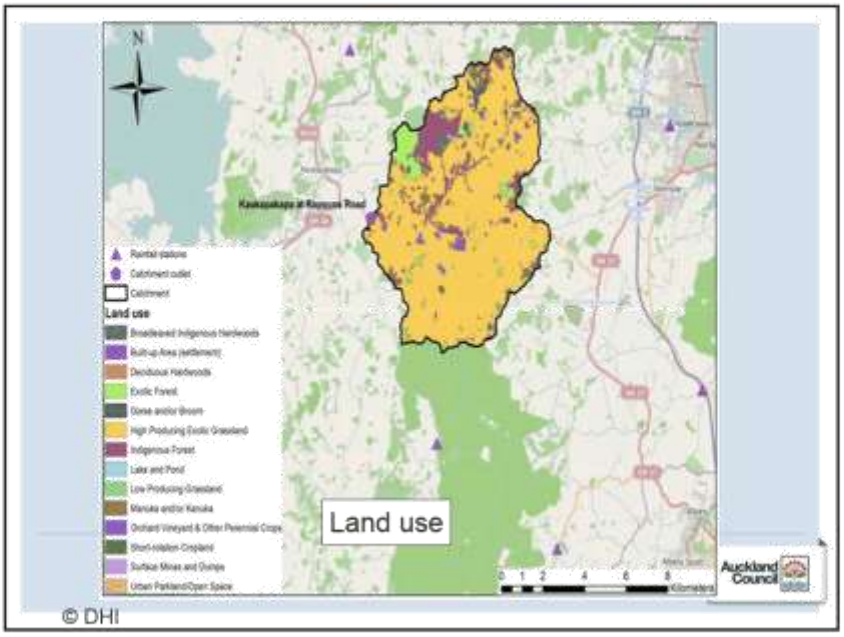
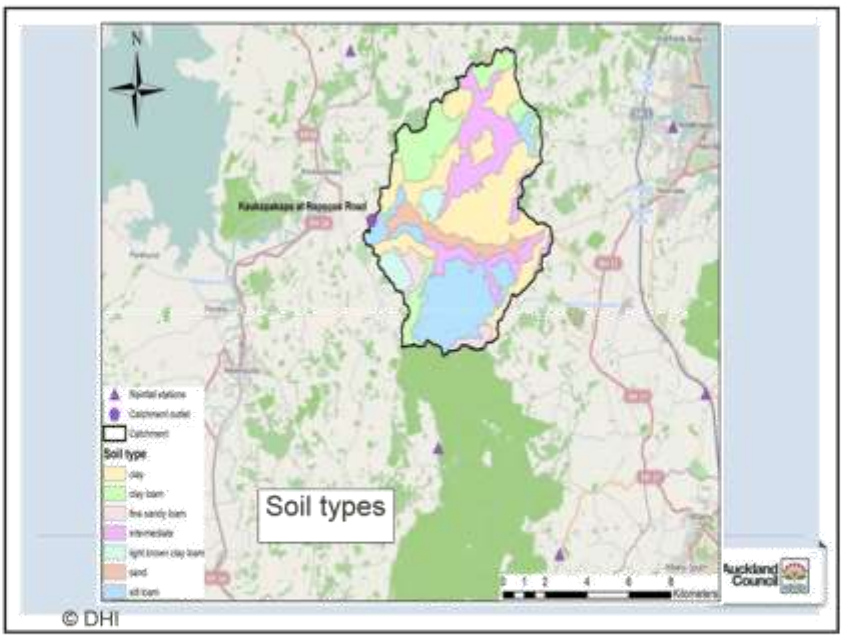
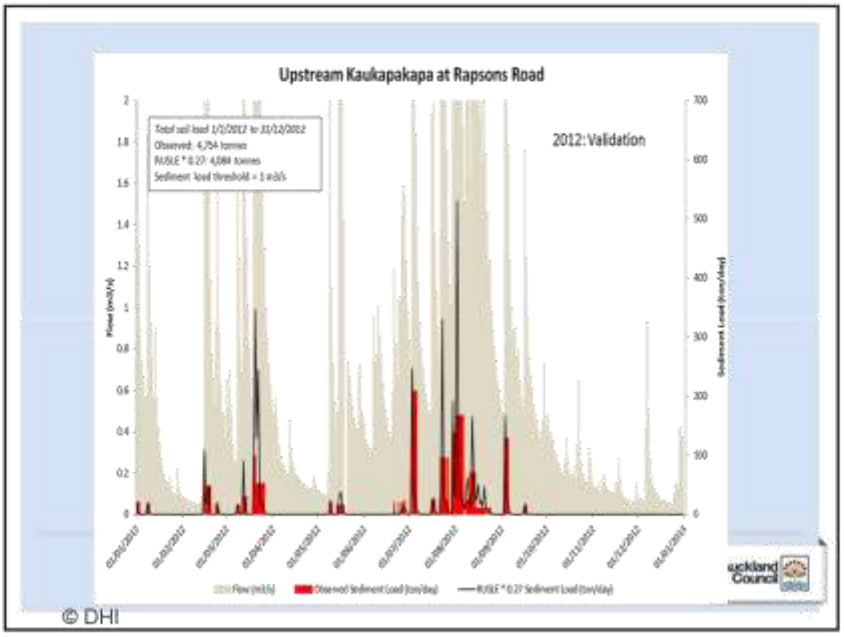
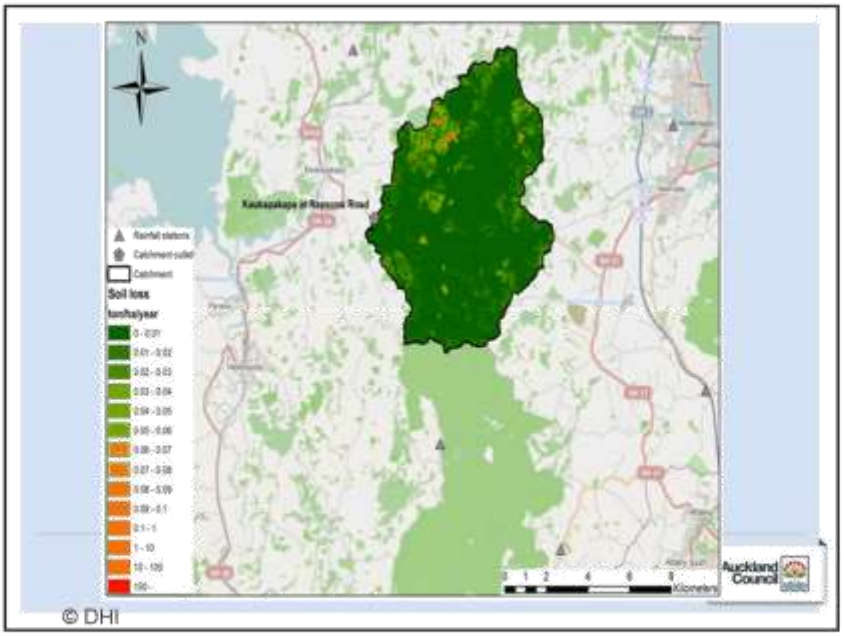



Upstream Kaukapakapa at Rapsons Road
2012: Validation
© DHI


Soil loss
ton/ha/year
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## Utilisation

Simulate soil losses in a climate change perspective.

Simulate soil losses for different land use and land management scenarios.

Simulate effect of soil control structures.



## Discussion

- What management options would the board like to be assessed e.g.
  - Examples from Auckland Council TP90
    - Earth Bund
    - Sediment Retention Pond
    - Silt Fence
    - Geosynthetics