

Sediments in Porirua Harbour

Presentation to Te Awarua-o-Porirua Whaitua Committee

27 August 2015

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The origin of Porirua Harbour



The origin of Porirua Harbour

Marine sediments

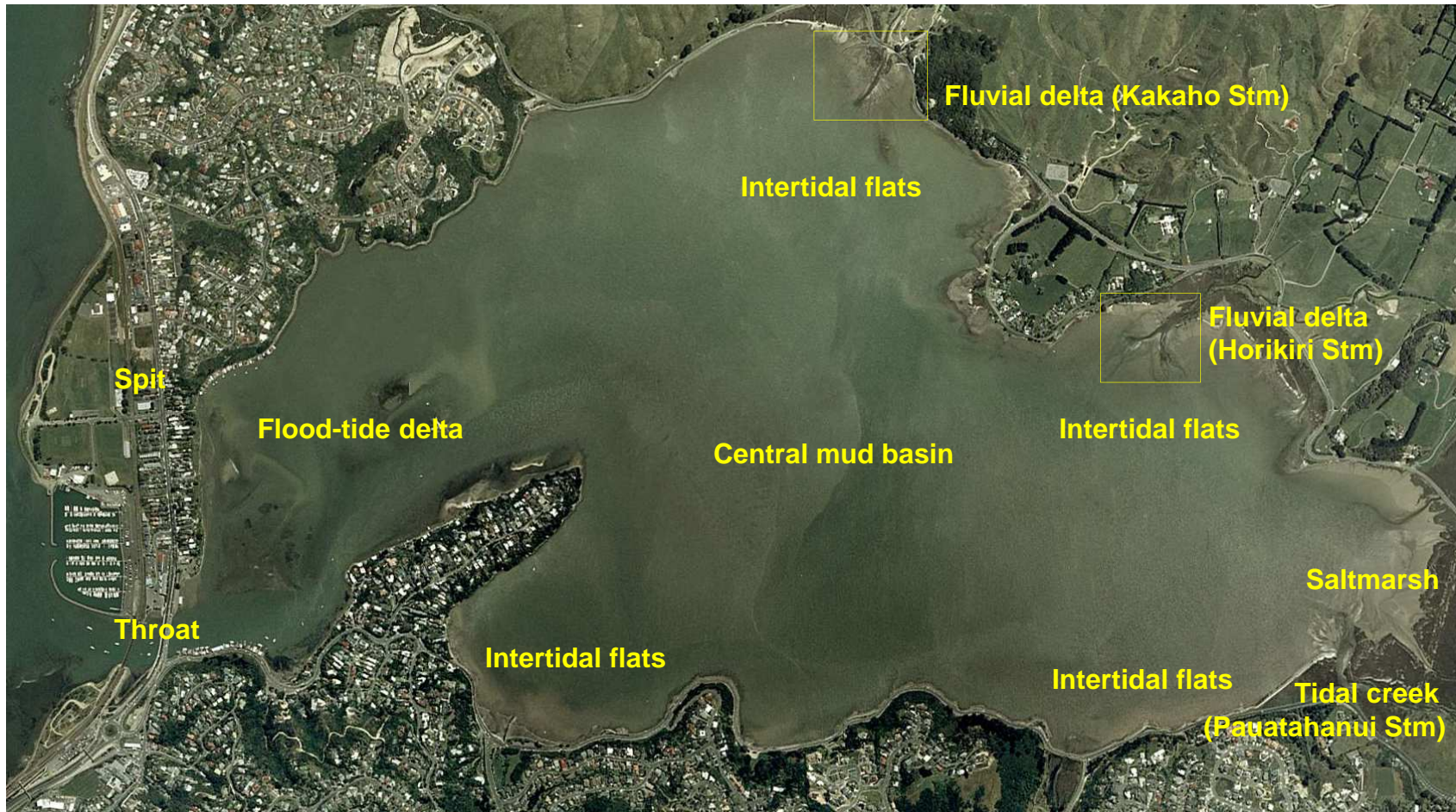


Image: Google.

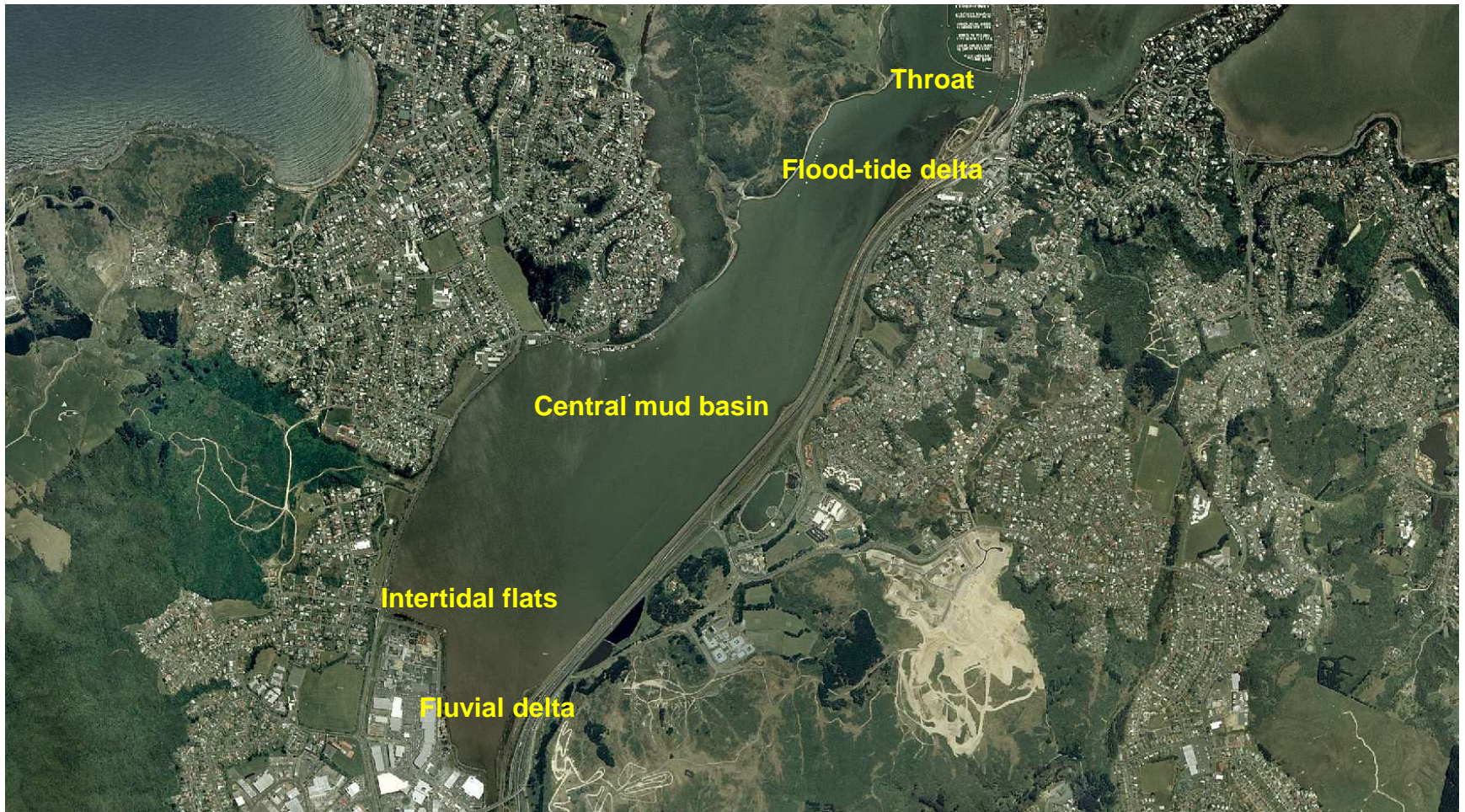


Terrestrial sediments

The components of Pauatahanui Inlet



The components of Onepoto

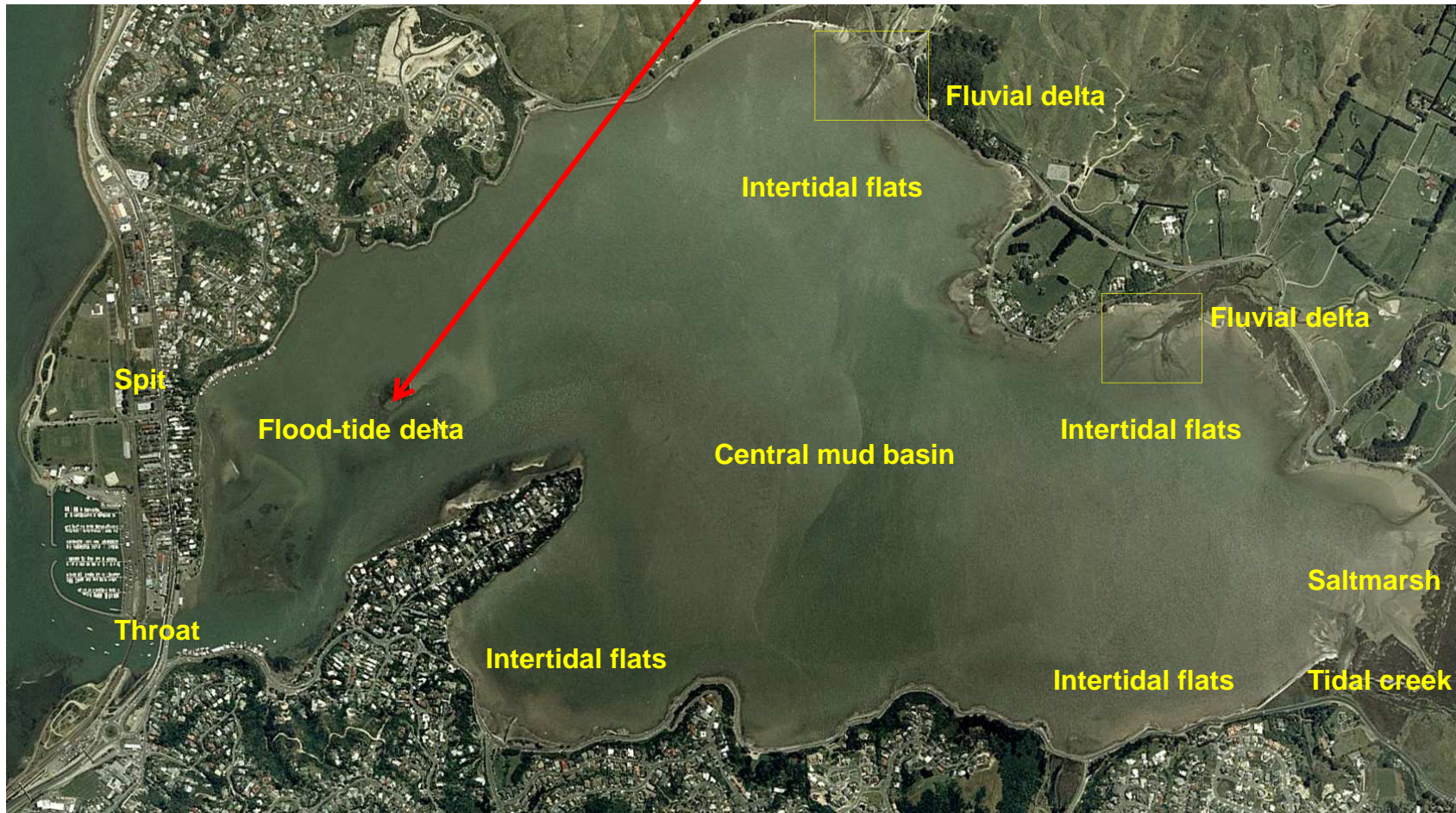


There are two different types of sediment problem in Porirua Harbour...



Problem (1)

Flood-tide delta navigability



Problem (2)

Marine sediments

Terrestrial sediment inputs have got bigger

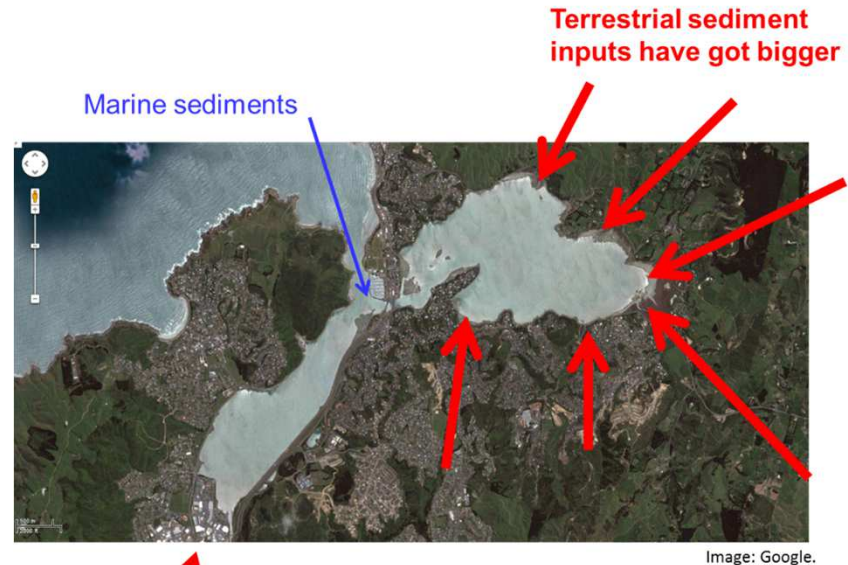
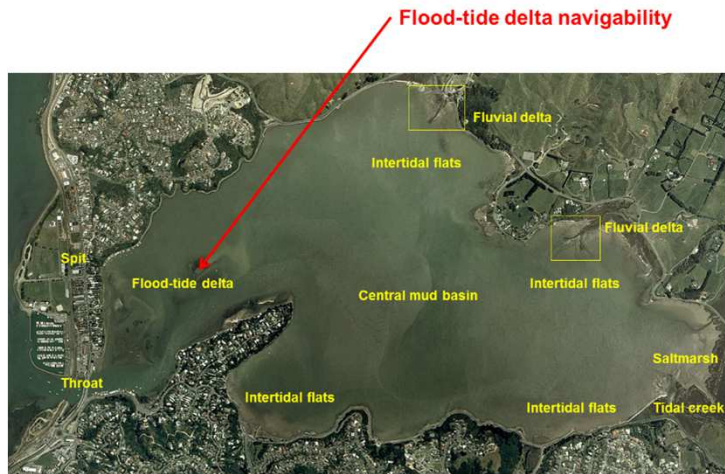


Image: Google.

Terrestrial sediments



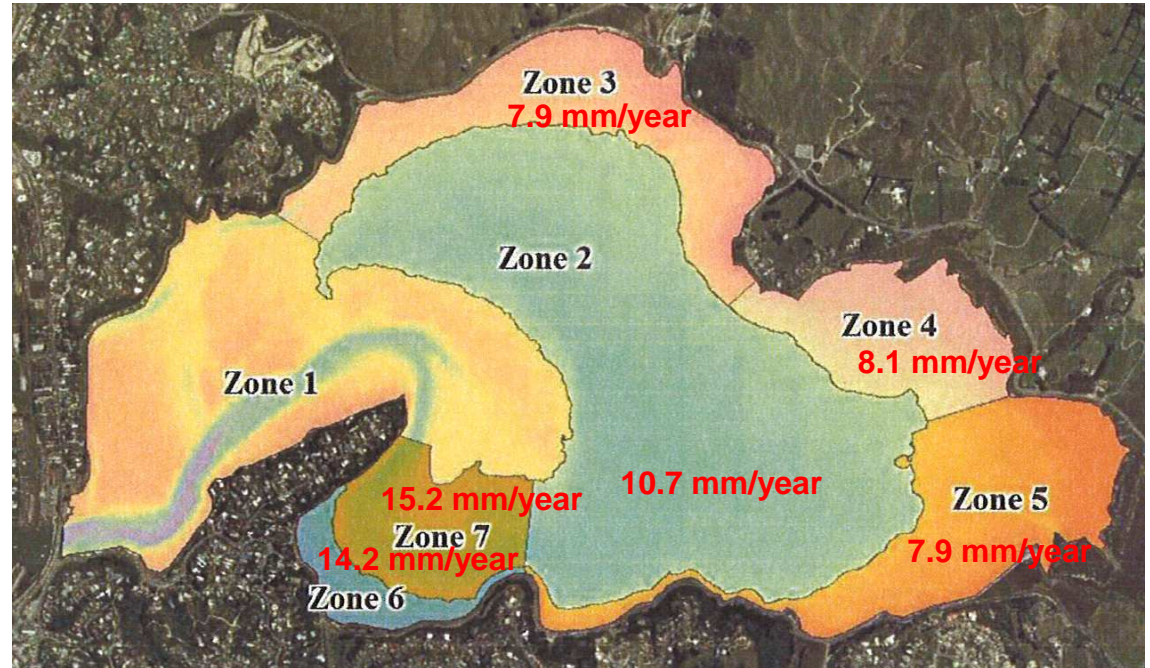
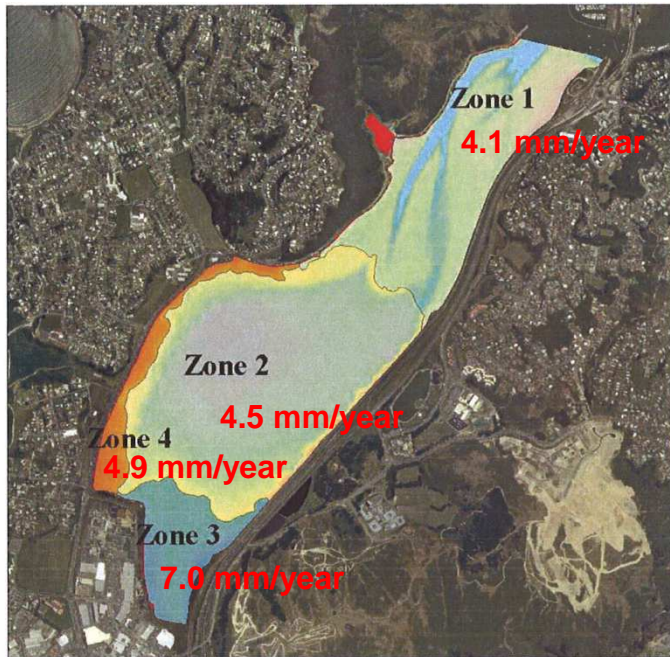
This is essentially about the natural variability of the flood-tide delta....



↑
Terrestrial sediments

.... but this is about catchment management.

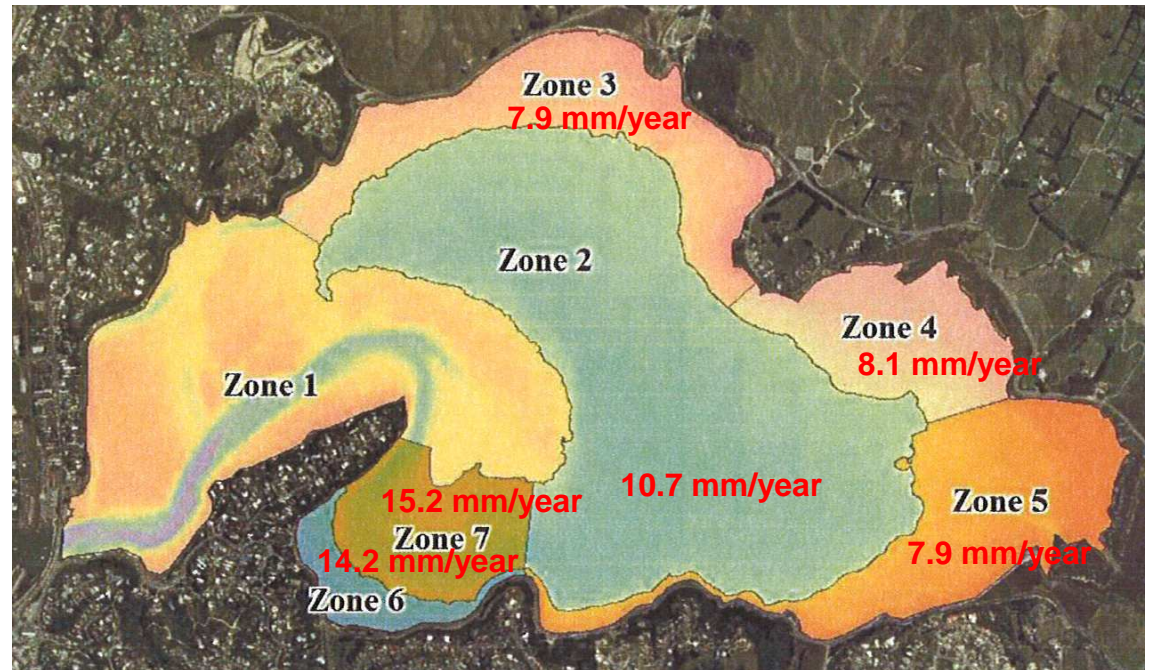
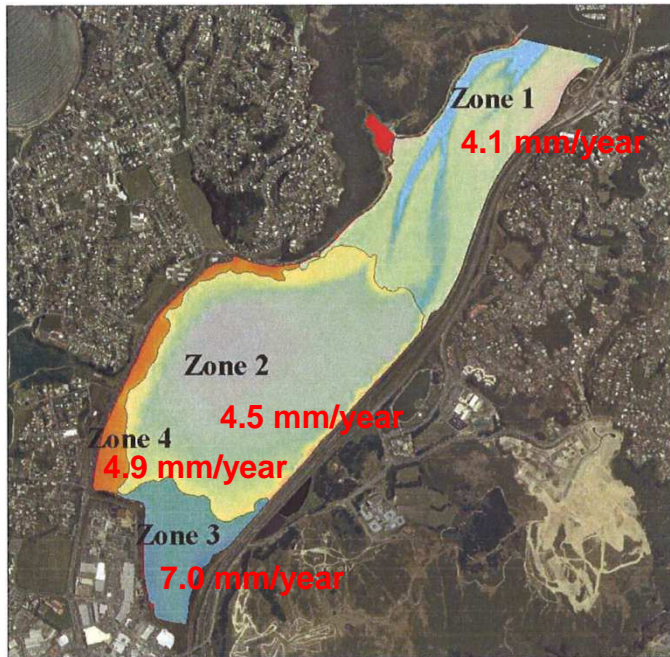
The size of the problem



Sedimentation rate over the period 1974 to 2009, estimated from bathymetric surveys. Gibb and Cox, 2009; 2011.

The size of the problem

Pre-catchment-disturbance
sedimentation rate 0.1-1 mm/year



Sedimentation rate over the period 1974 to 2009, estimated from bathymetric surveys. Gibb and Cox, 2009; 2011.

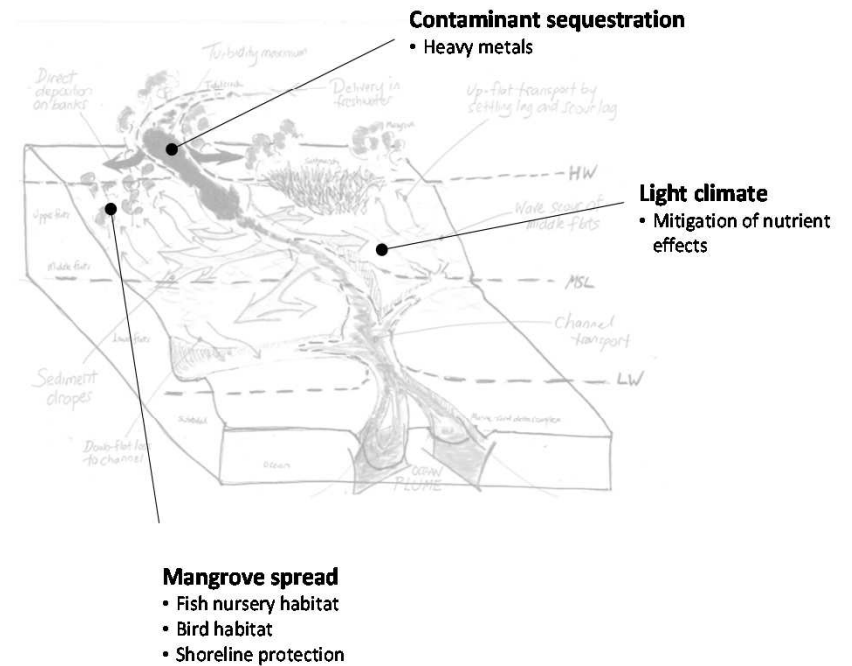
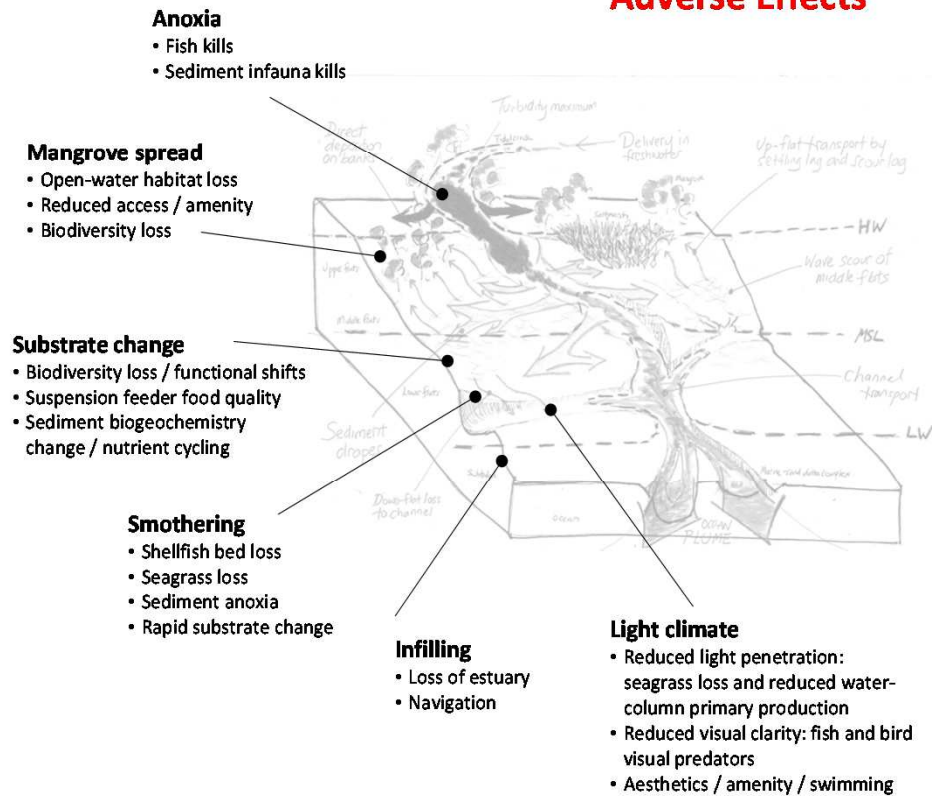
Consequences

Ecological

FINE SEDIMENT

Adverse Effects

Beneficial Effects



Consequences



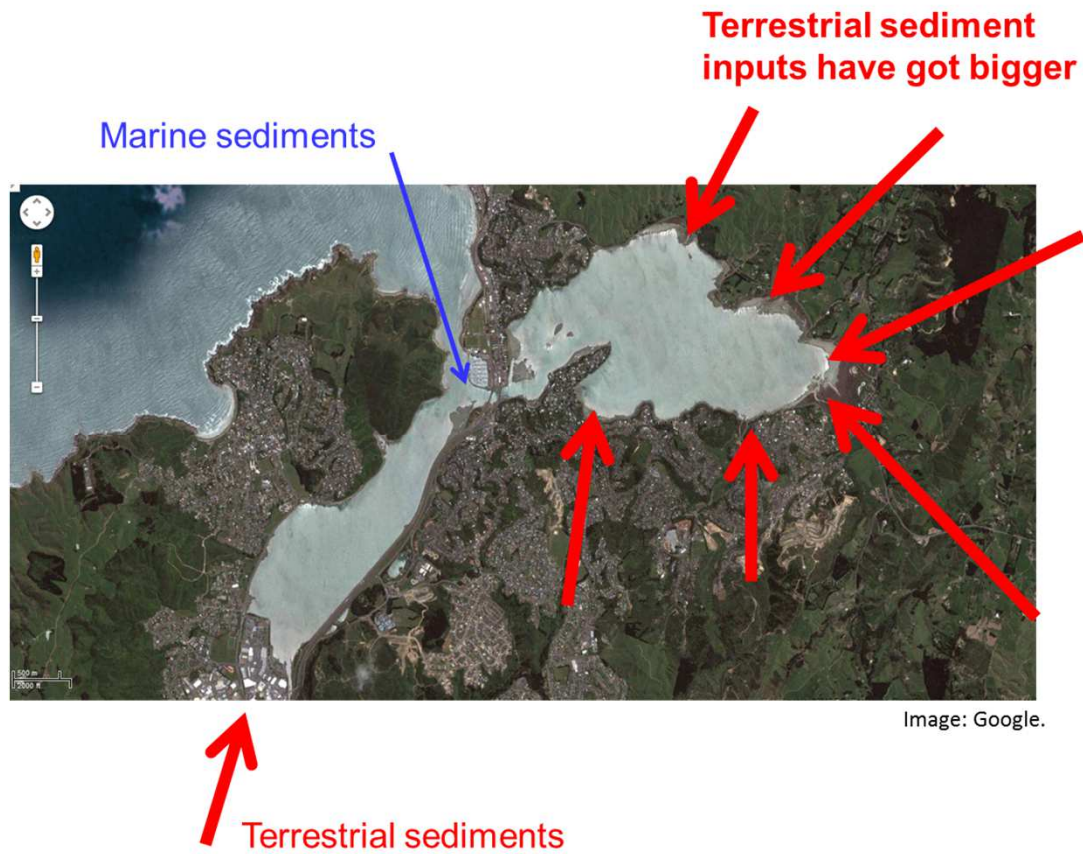
Human amenity

- Reduction in clarity – contact recreation, aesthetics
- Shoaling
- Change in underfoot condition
- Shellfish gathering
- Mauri

Geomorphological

- Premature loss of the harbour

By how much do we need to reduce the terrestrial sediments to make a difference?



There are any number of attributes that we could set targets or objectives around...

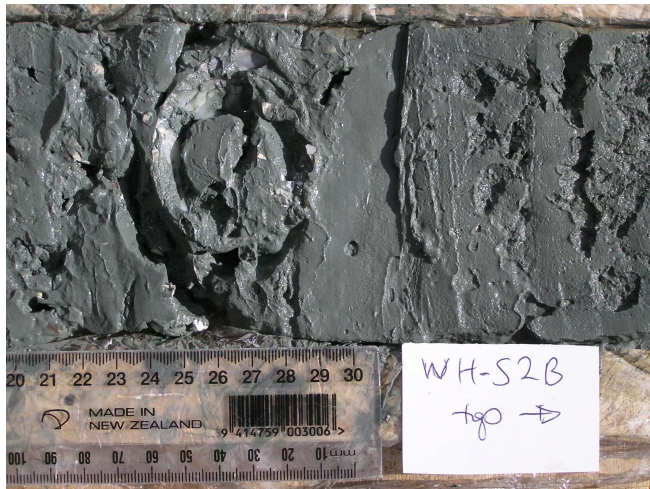


Sediment deposition rate

Suspended-sediment concentration

... but, this far, we have chosen an average annual sedimentation rate for a target because:

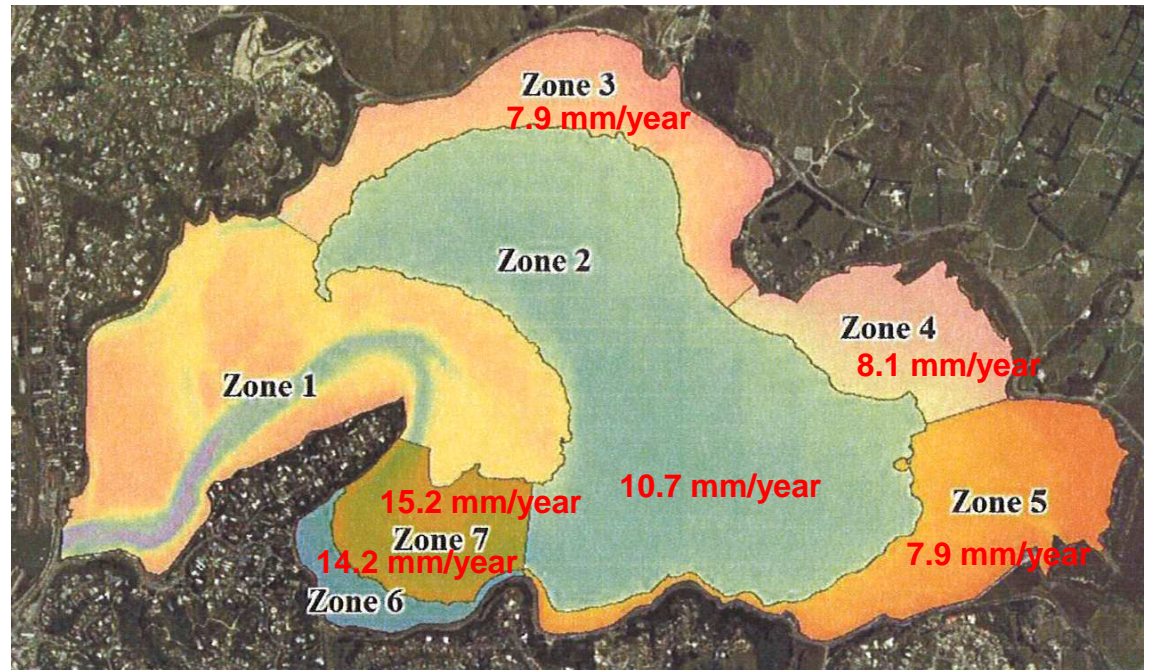
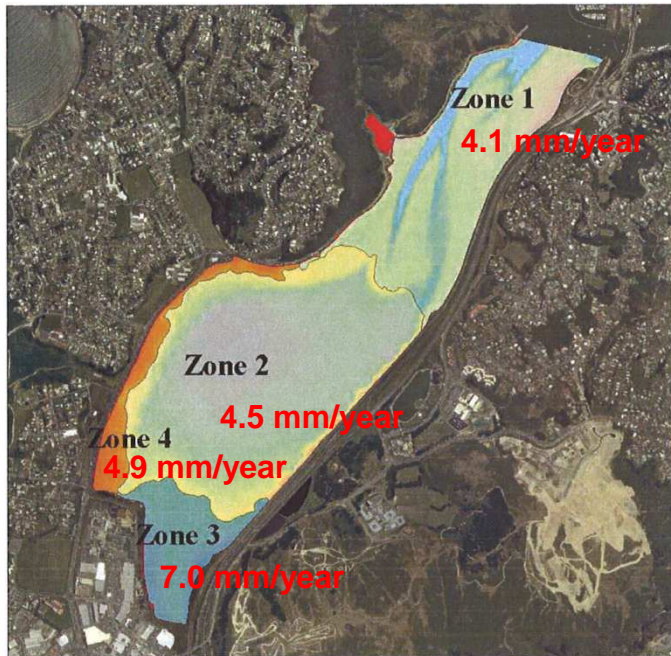
- Measurable
- Easy to understand and explain
- Sets the foundation for management of the catchment
- Anticipate that a range of co-benefits will be delivered on the back of the average annual sedimentation rate



Also, there is a rationale for coming up with a specific target...

Pre-catchment-disturbance: 0.1-1 mm/year

Today:



Target: 1 mm/year

What do we now do with that target?

- Back-calculate catchment sediment runoff that will achieve the sedimentation target
- Call this the sediment (runoff) limit
- Work out how to arrange and conduct activities in the catchment so that the limit is not exceeded
- Implement those arrangements
- Monitor to check that:
 - the sediment runoff limit is not being exceeded
 - the target sedimentation rate is being achieved
 - the co-benefits are being delivered on the back of the target sedimentation rate
 - If not, go back and figure out why, and fix it.



Catchment sediment runoff limits will also be required to provide for freshwater ecosystem health and human amenity values...

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 - Monitor to check that:
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 - the co-benefits are being delivered on the back of the target sedimentation rate
- If not, go back and figure out why, and fix it.

... it is crucial that these be matched with the catchment sediment runoff limit that is required to achieve the estuary sedimentation target.



