



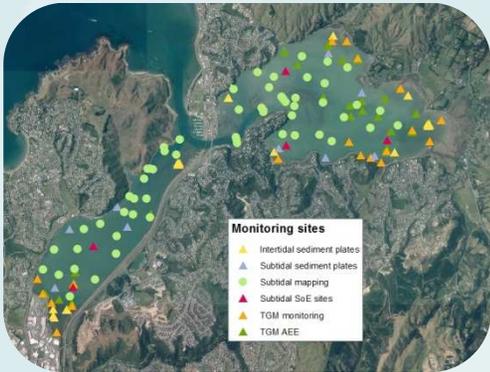
Te Awarua-o-Porirua Harbour & catchment

Environmental science overview

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Environmental Science

Presentation to the Te Awarua-o-Porirua Harbour and Catchment Whaitua committee - 24 August 2017



- **Sedimentation**

- Turbidity monitoring
- Sediment deposition
- Mud content

- **Pollution**

- Freshwater quality
- Recreational water quality
- Estuary sediment health

- **Ecological degradation**

- Estuary habitat mapping – seagrass and mud/sand
- Native freshwater fish values

Sedimentation

PH&C Strategy

Objective: To reduce sedimentation rates

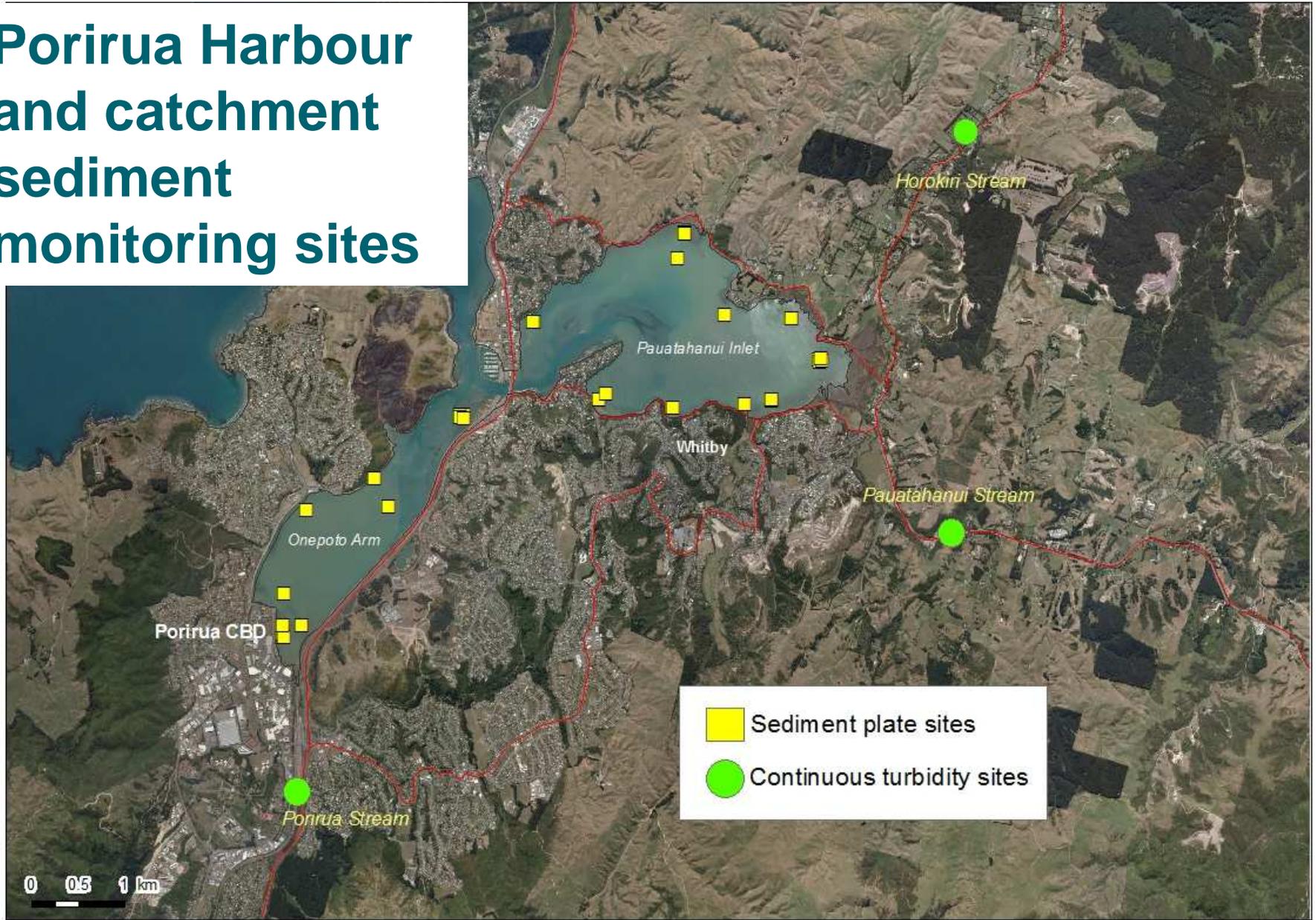
Target: To reduce sediment inputs

- by 50% by 2021, &
- SAR to 1 mm/yr by 2031

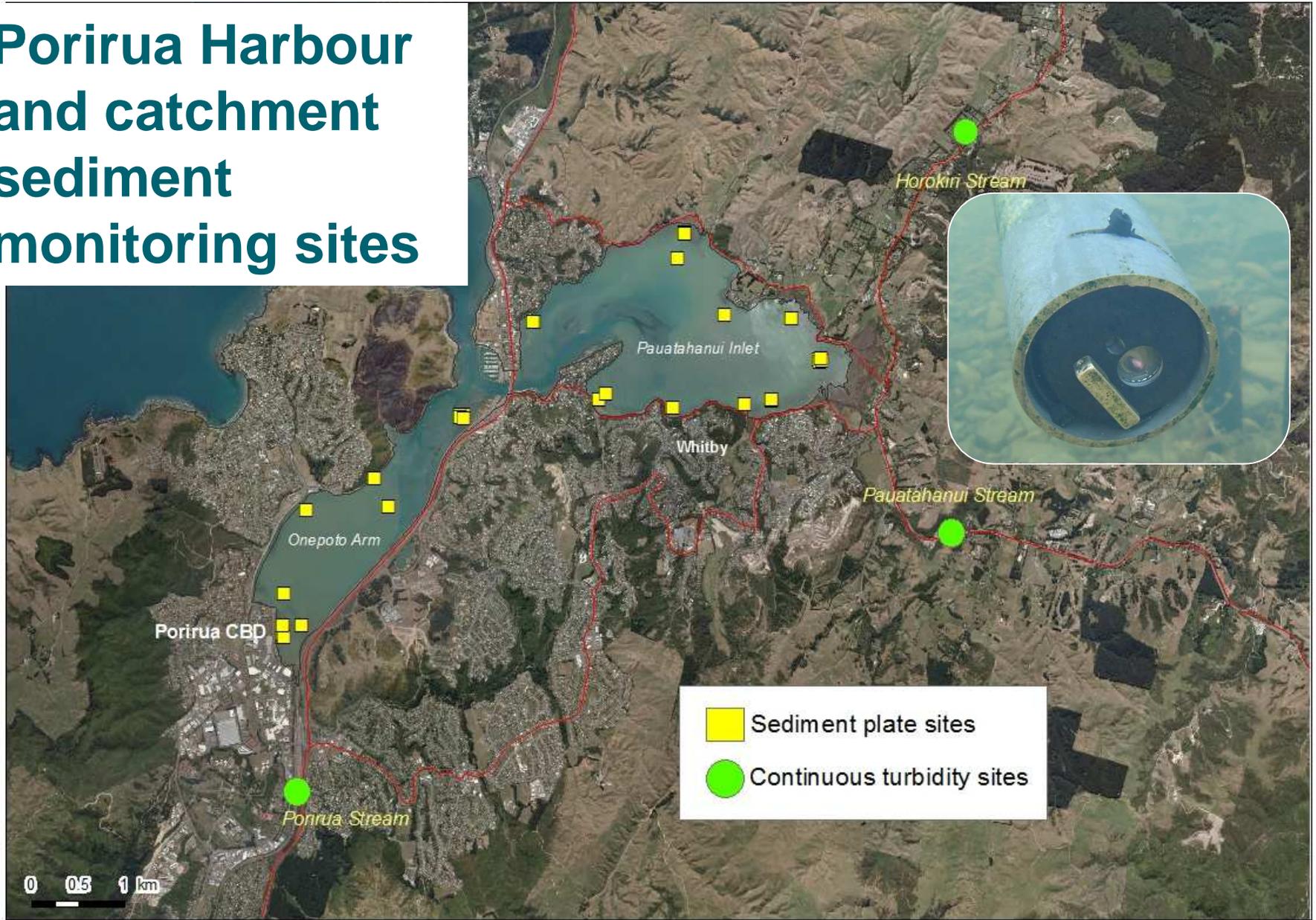
“...develop an estuary and catchment modelling programme.”
and *“...bathymetric survey...”*



Porirua Harbour and catchment sediment monitoring sites



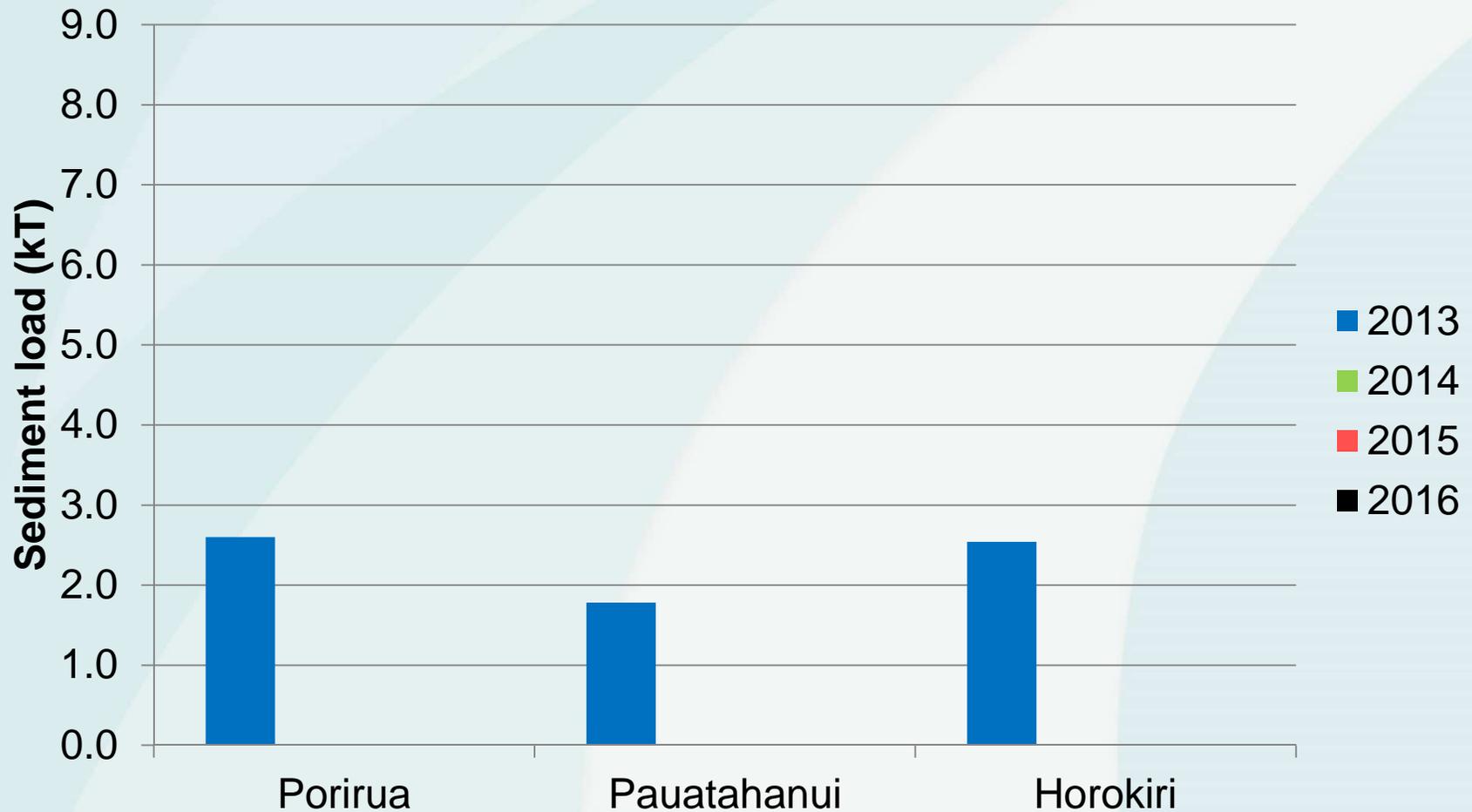
Porirua Harbour and catchment sediment monitoring sites



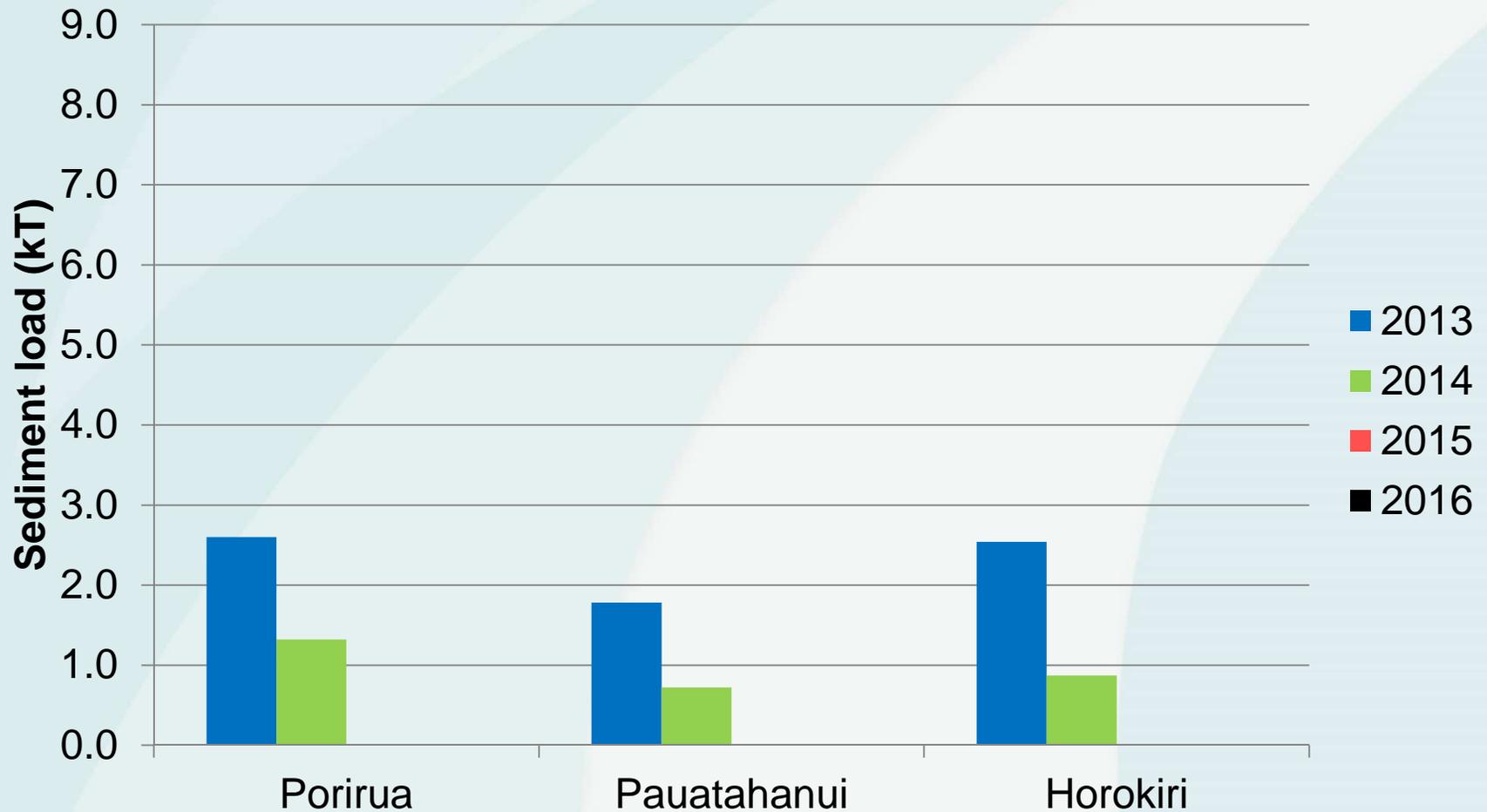
Porirua Harbour and catchment sediment monitoring sites



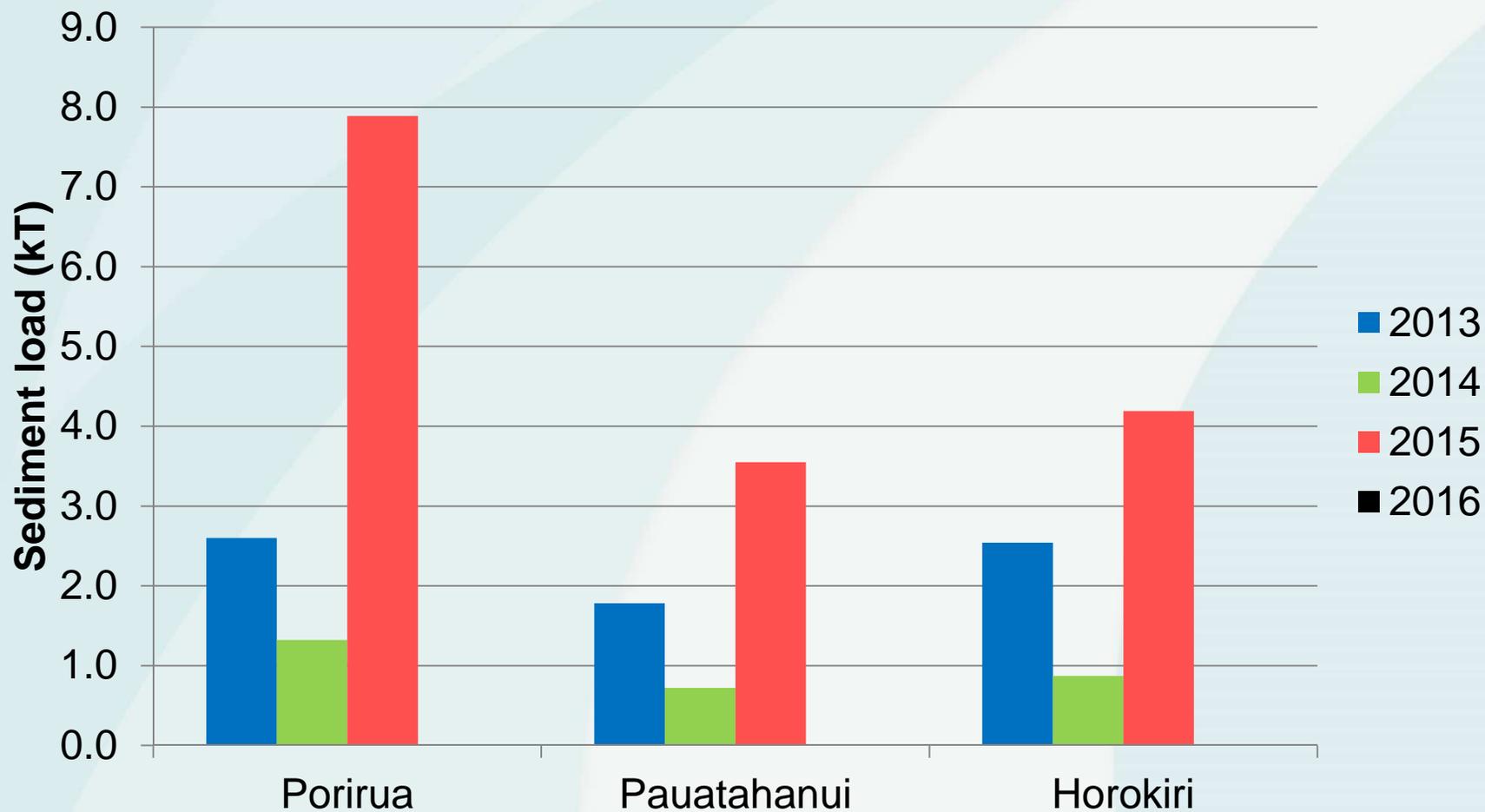
Catchment sediment loads



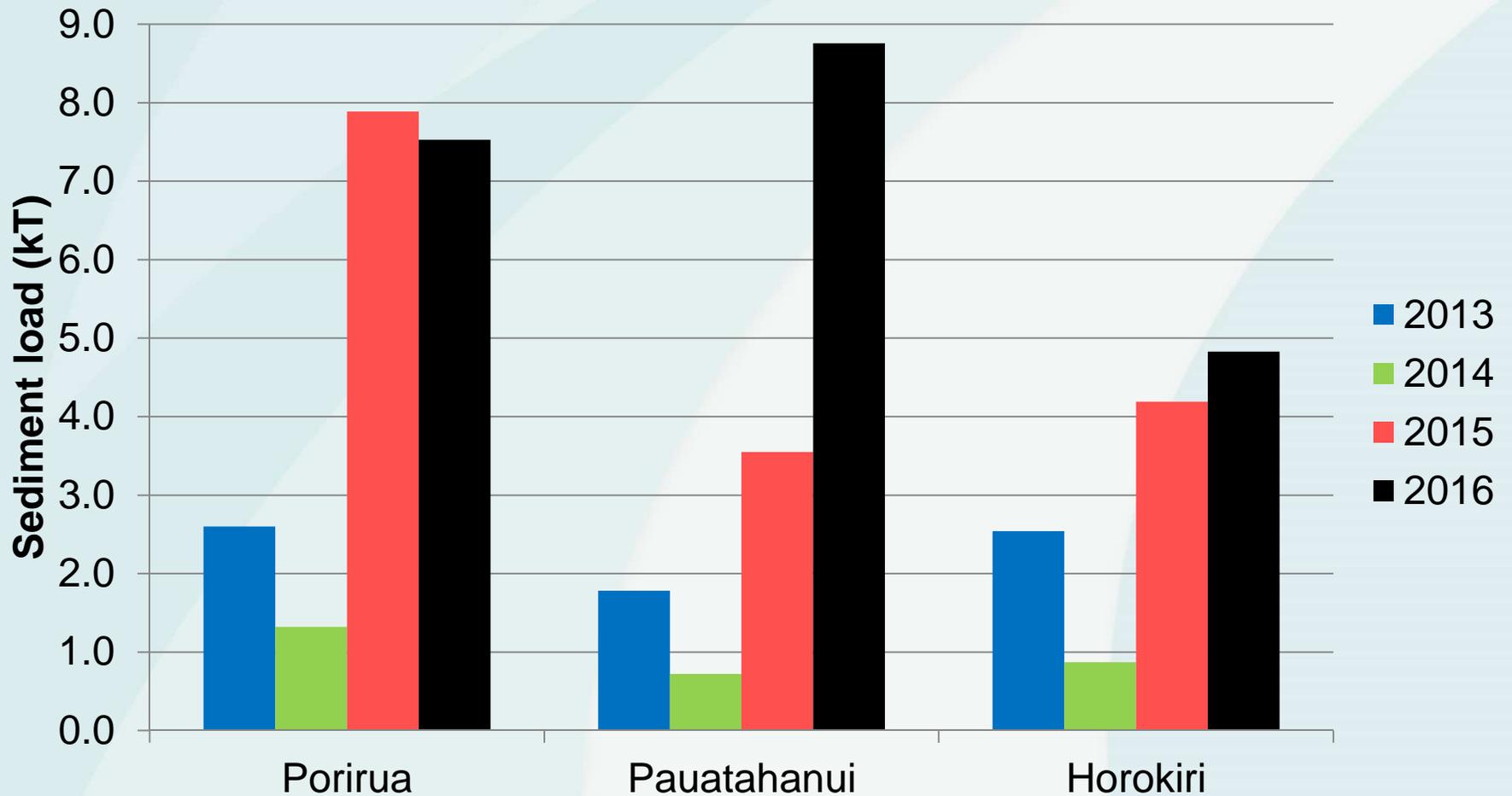
Catchment sediment loads



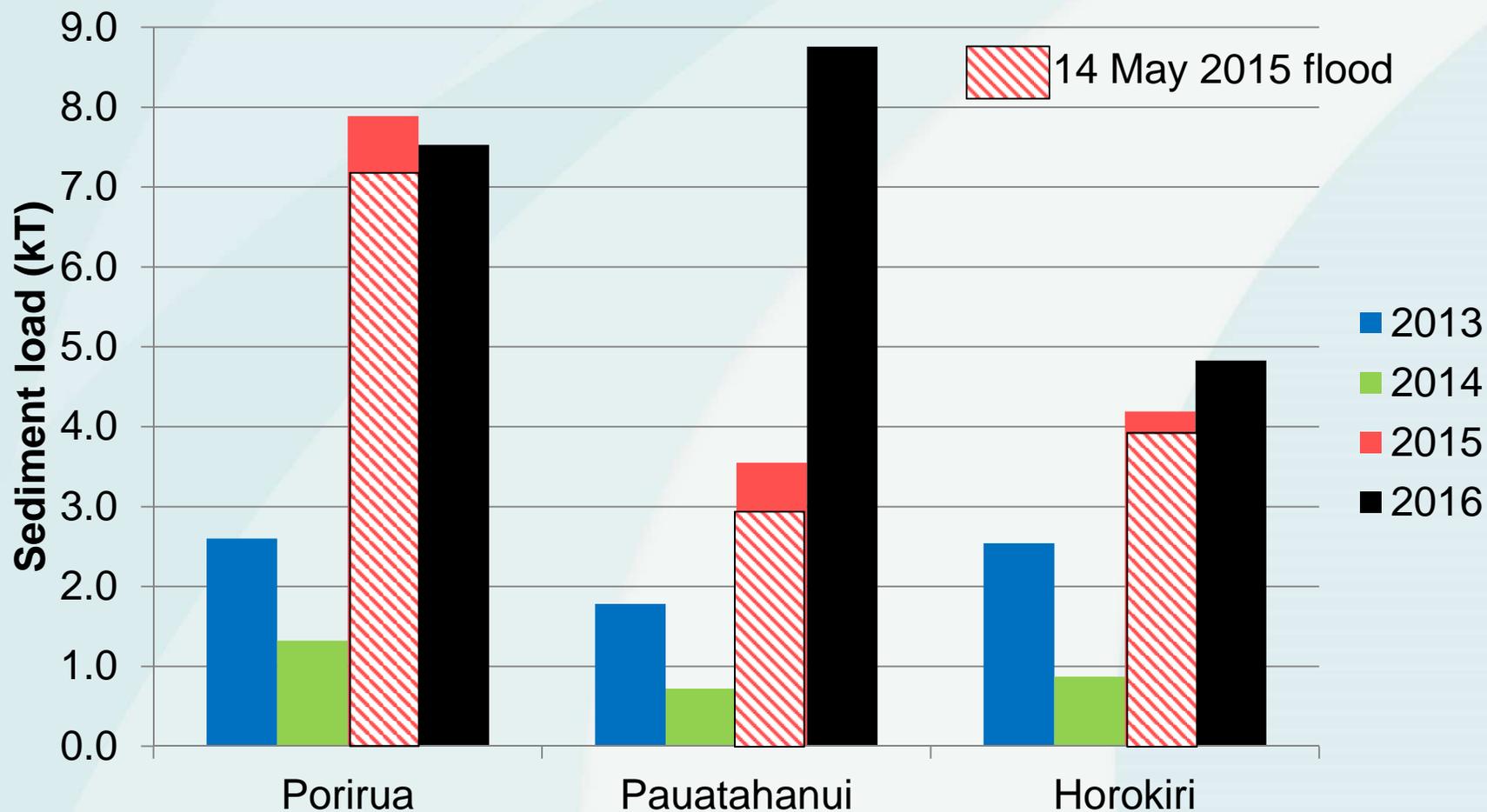
Catchment sediment loads



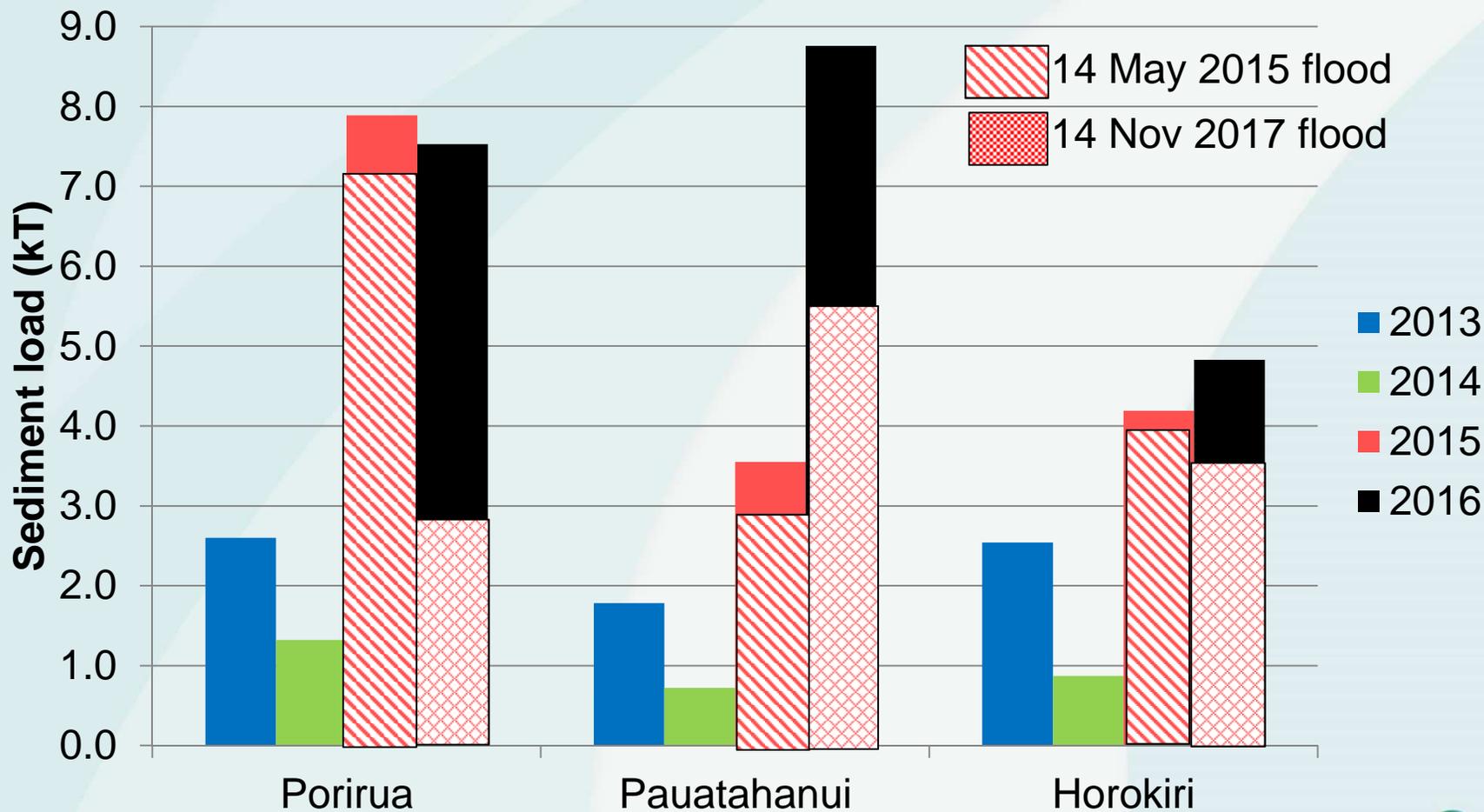
Catchment sediment loads



Catchment sediment loads

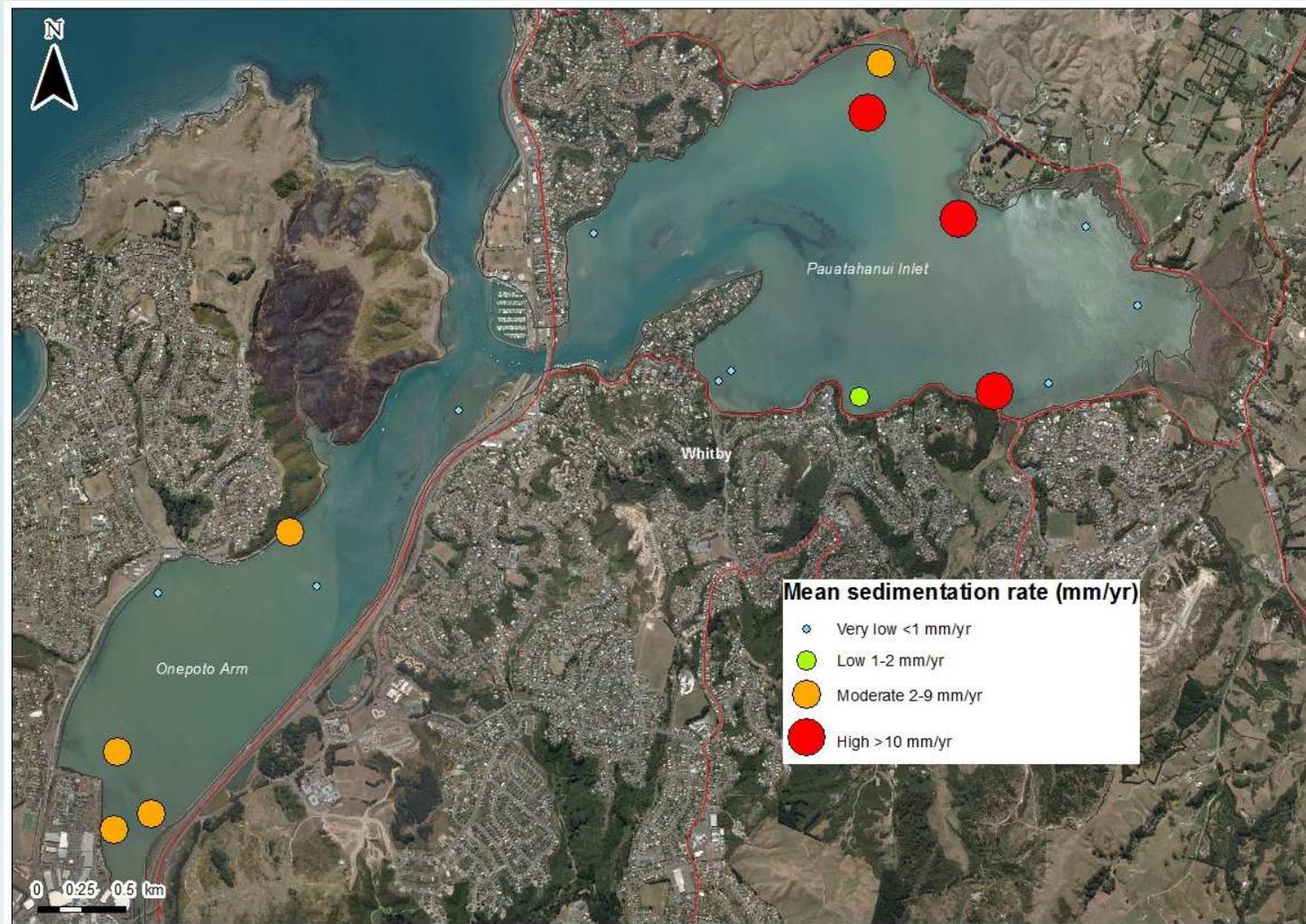


Catchment sediment loads

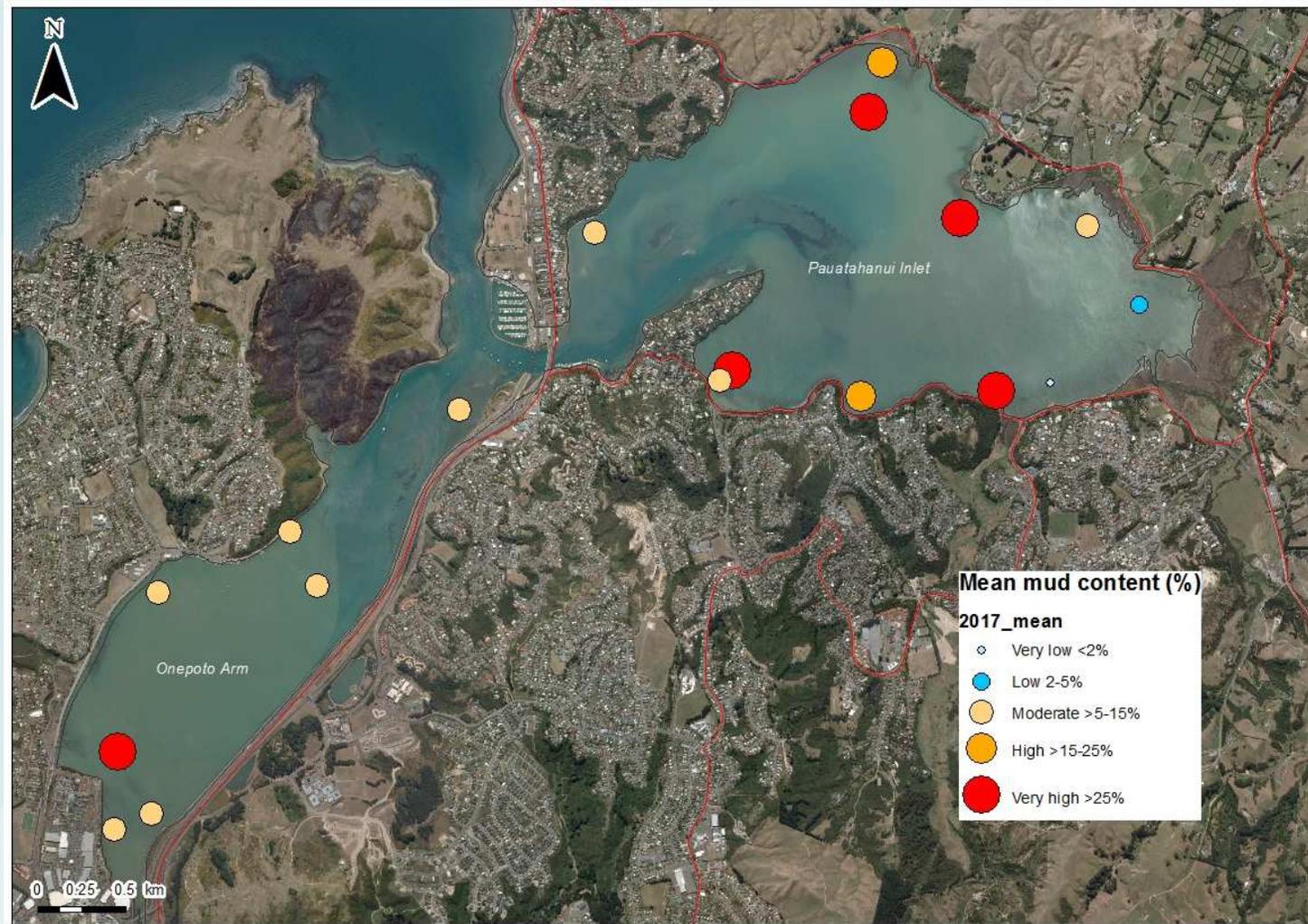




Mean sedimentation – 2015-17



Mean mud content – 2015-17



Sediment quality

| Indicator | Onepoto Arm Intertidal | Onepoto Arm Subtidal | Pauatahanui Arm Intertidal | Pauatahanui Arm Subtidal |
|----------------------|------------------------|----------------------|----------------------------|--------------------------|
| Mud content | Low-moderate | Very high | Low-moderate | Very high |
| Organic content | Low | Moderate-high | Low | Moderate-high |
| Sediment oxygenation | Moderate | Low-moderate | Moderate | Moderate-high |



In summary..

- Still characterising the catchment sediment inputs
- Large pulsed inputs of sediment are significant
- Mud content increasing
- Sedimentation rates highly variable between years
- Frequency of large rainfall events expected to increase in the future
- Implications for how we manage areas of open land



Pollution

PH&C Strategy

Objective: To reduce pollutant inputs

Target: To reduce faecal, nitrogen and toxicant inputs

“...investigate sources of toxicants...” and continuous microbial water quality forecasting”



Stream water quality – state and trends

- Porirua – degrading turbidity and E.coli (5 yr trend)
- Horokiri – improving clarity (5 yr trend) –
- Pauatahanui – improving clarity (5 yr trend)
- All other WQ variables show no clear trend – rated fair across sites
- Invertebrate community health also no trend – rated good to fair across sites

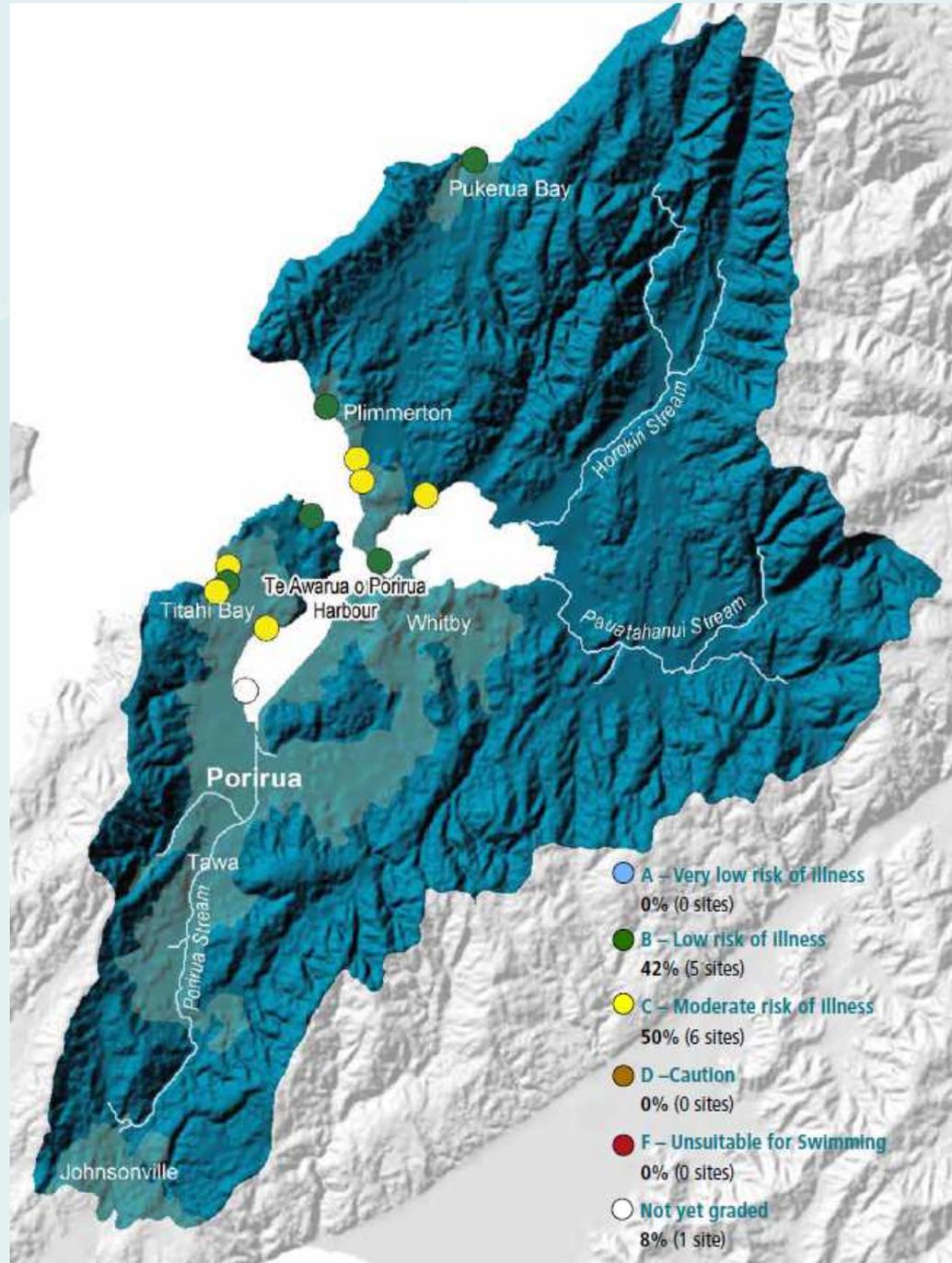


Is it safe to swim in Porirua?

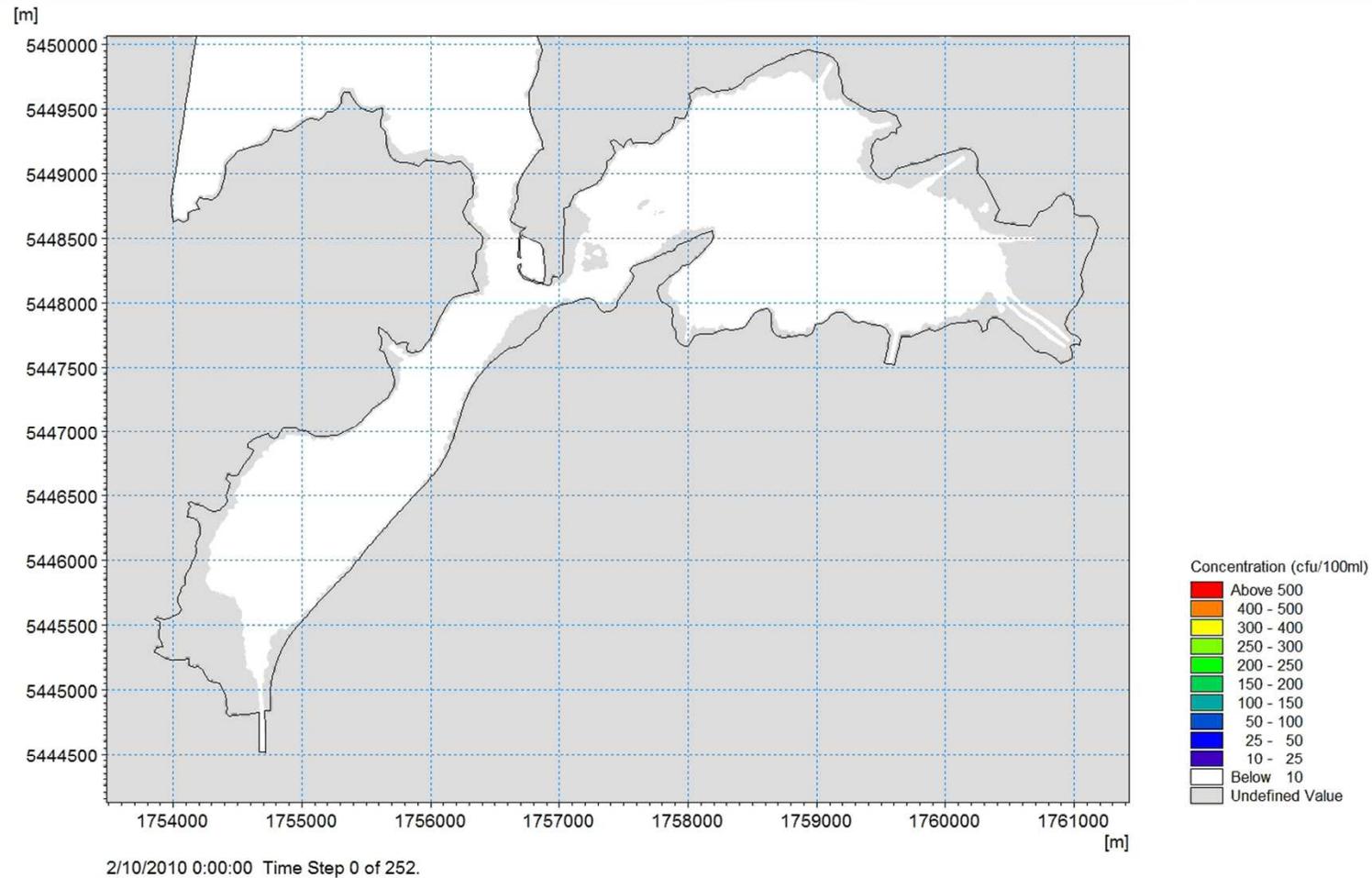
Recreational water quality monitoring results for the 2016/17 summer



- 12 coastal sites monitored; 4 in the harbour
- New site at the waka ama club



Swimming forecast (N-NW)



Microbial forecasting - trial website

http://web.nz.dhigroup.com/PoriruaWQ/map

Porirua Bathing Water Fore...

DHI

MAP PRECIPITATION WATER QUALITY ANIMATION ABOUT public Logout

Base Map: Google Roadmap

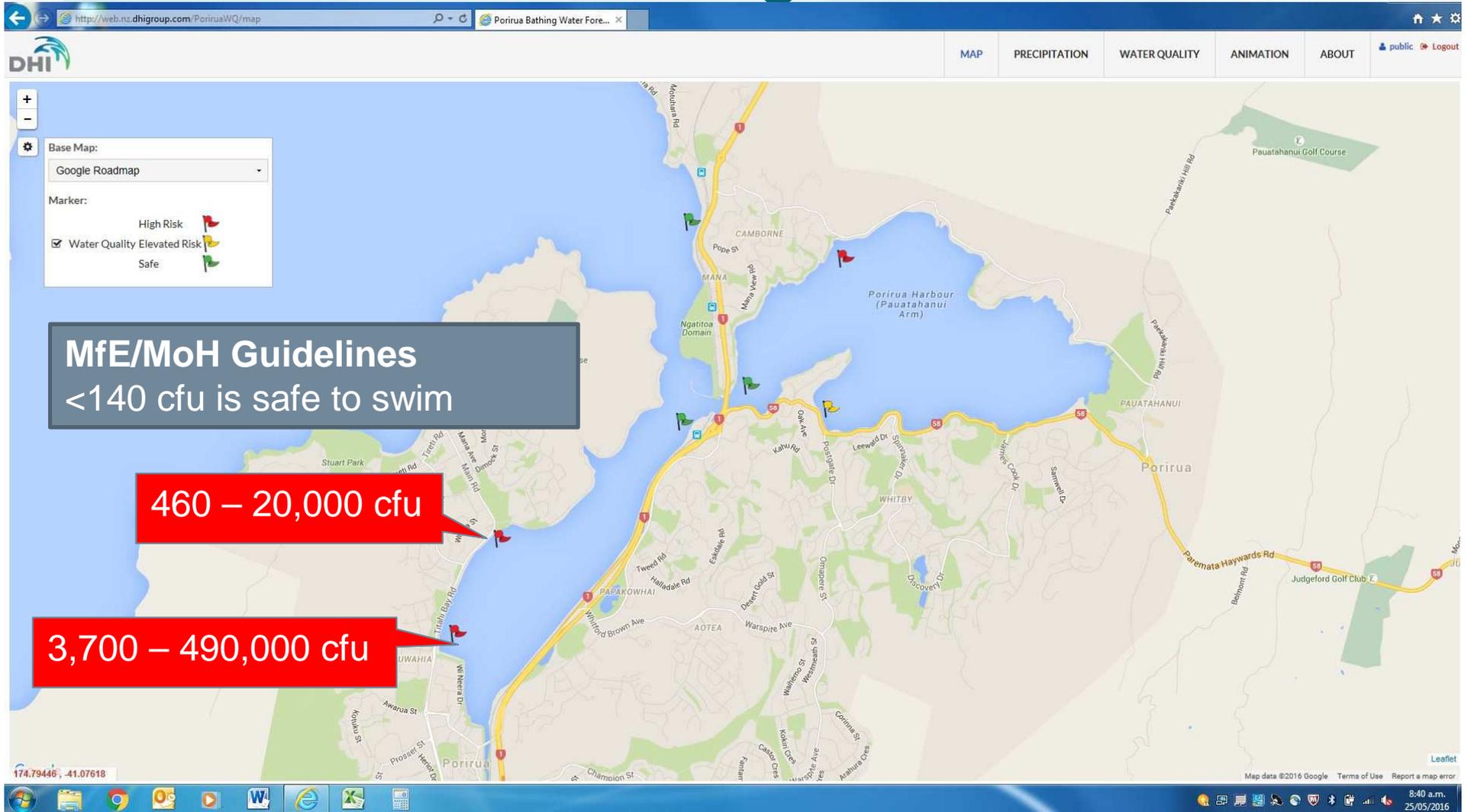
Marker: High Risk Water Quality Elevated Risk Safe

174.79446, -41.07618

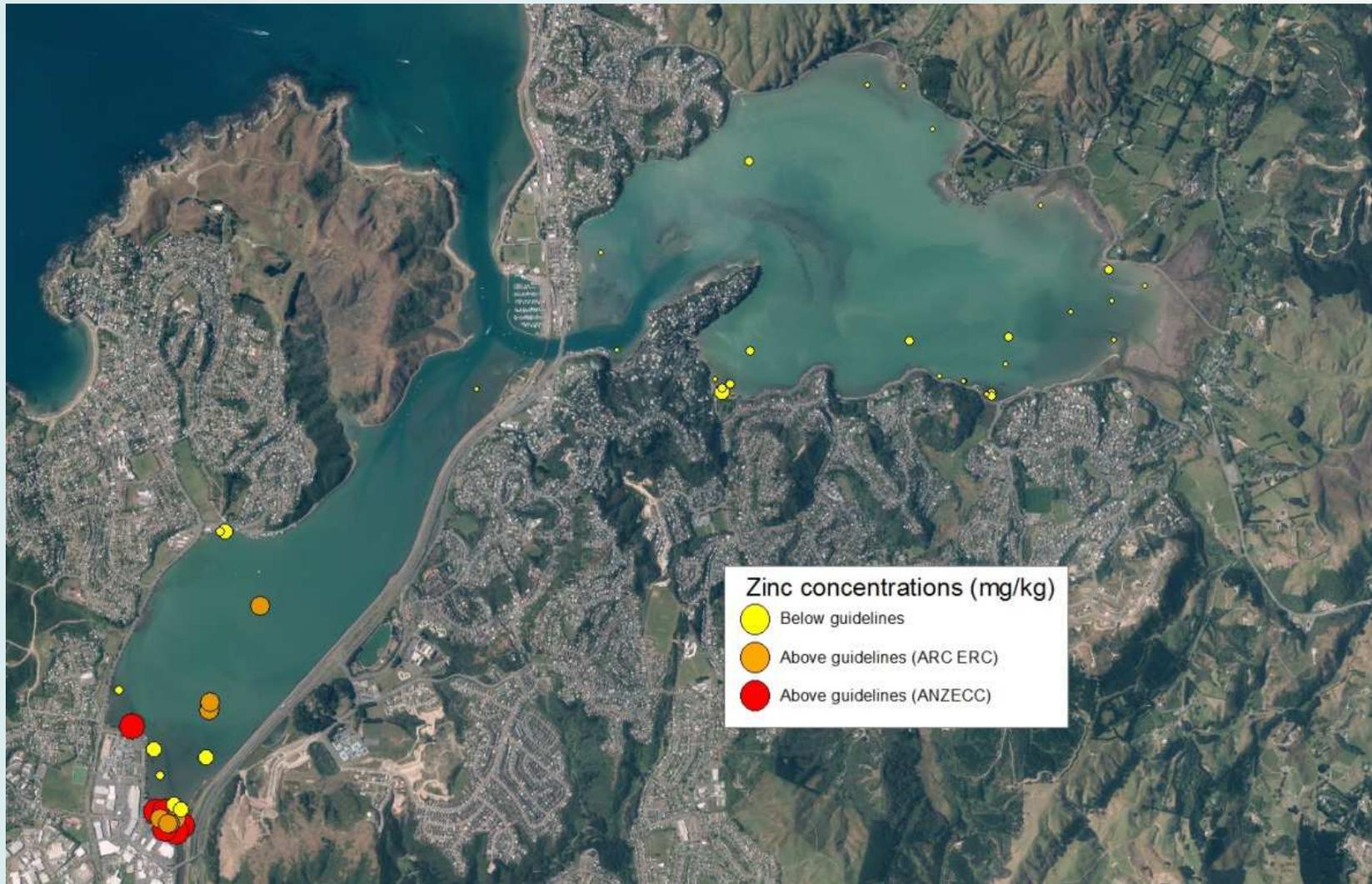
Map data ©2016 Google Terms of Use Report a map error

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Microbial forecasting - trial website

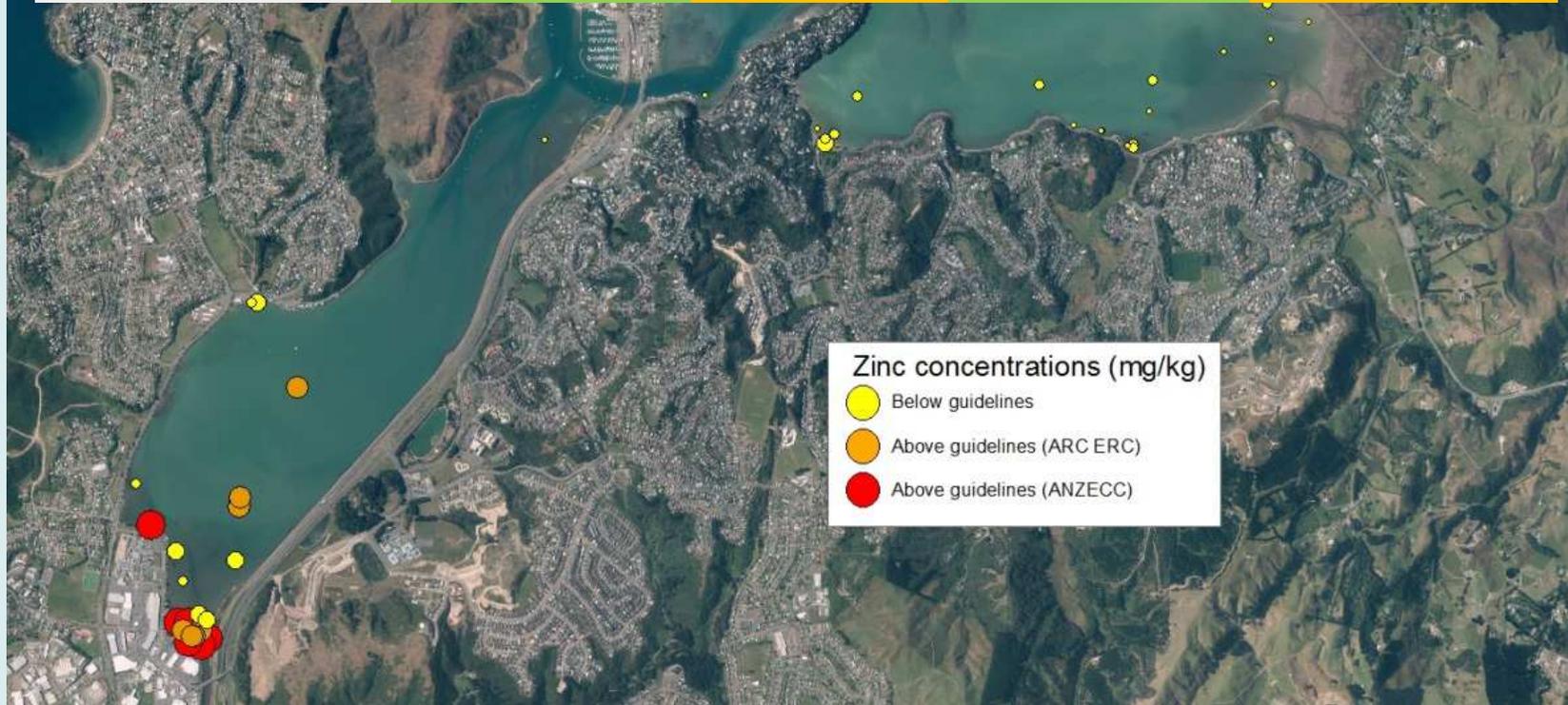


Sediment contaminants

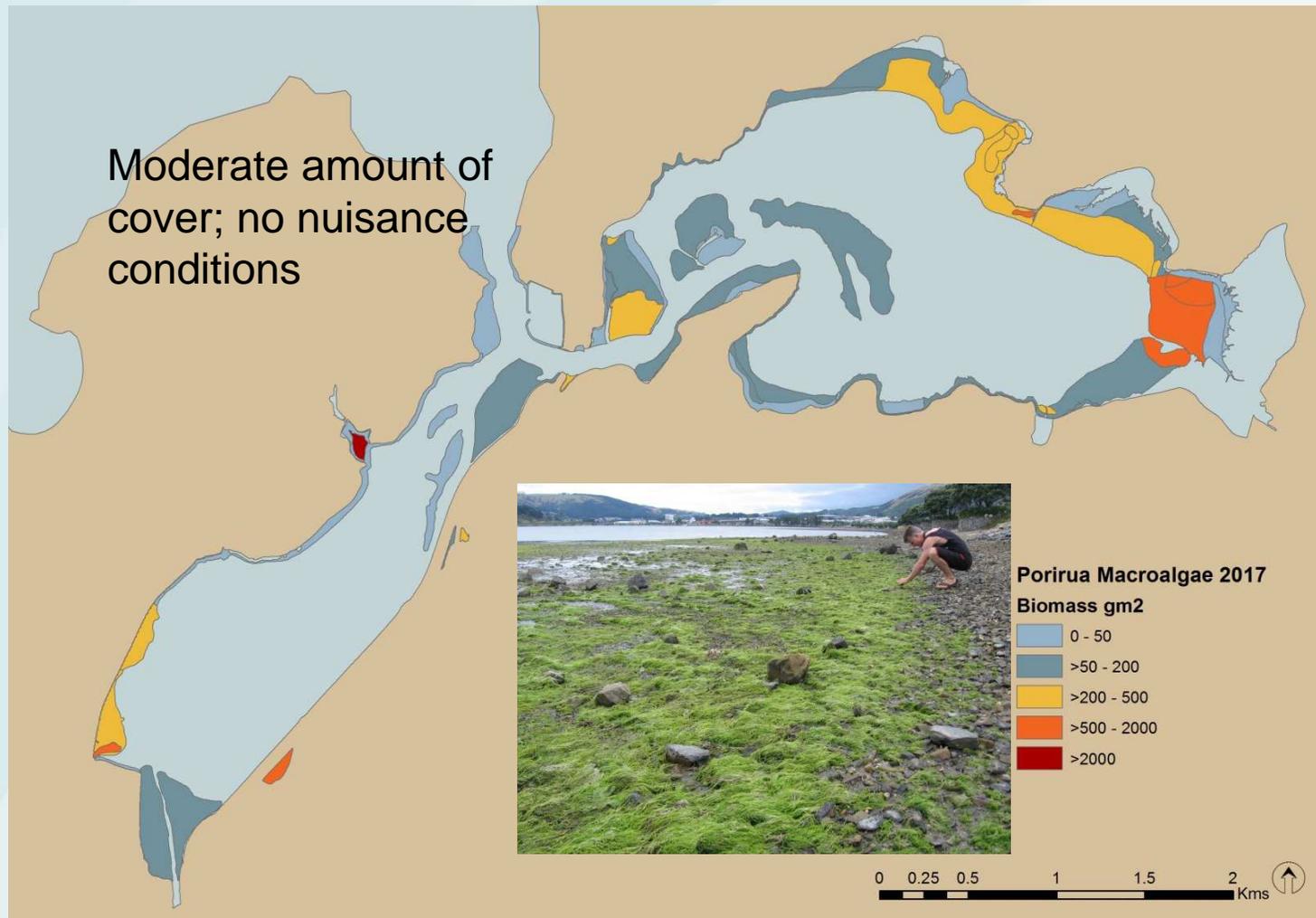


Sediment contaminants

| Indicator | Onepoto Arm Intertidal | Onepoto Arm Subtidal | Pauatahanui Arm Intertidal | Pauatahanui Arm Subtidal |
|-----------------|--------------------------|----------------------|----------------------------|--------------------------|
| Nutrients (N&P) | Low-moderate | - | Low-moderate | - |
| Toxicants | Very low (some hotspots) | Zn, Cu, Pb, DDT | Very low | DDT |



Habitat mapping - macroalgae



Invertebrate health

- Community health good with tendency towards more tolerant species
- Invertebrate community health generally poorer in Onepoto
- No change over 13 yrs



In summary...

- Stream health fair, failing on E.coli and nutrients
- Harbour water quality poor for swimming; ongoing wastewater issues
- Hotspots of contamination in harbour sediments; no change in >10 yrs
- Invertebrate health in streams and harbour good; increasing proportion of tolerant species



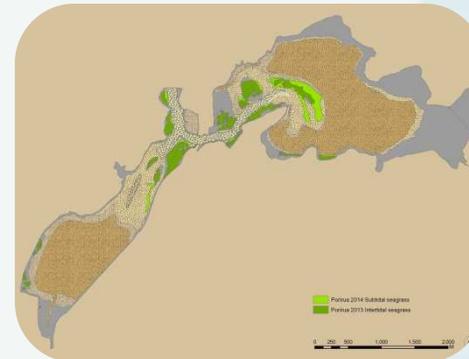
Habitat loss

PH&C Strategy

Objective: Restore ecological health

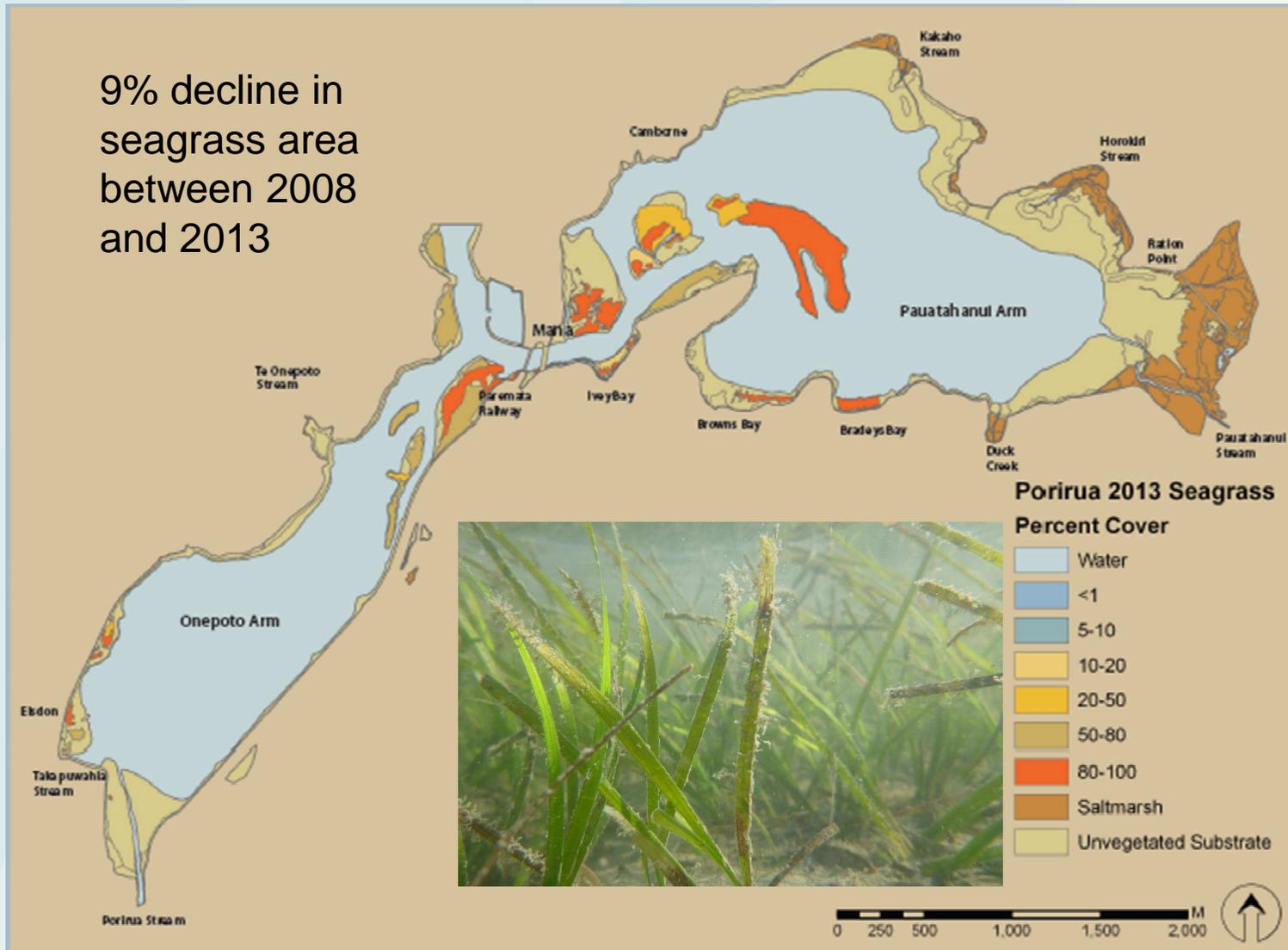
Target: Extend seagrass and saltmarsh cover, increase riparian cover

*“...estuary habitat mapping”
and “...seagrass restoration...”*



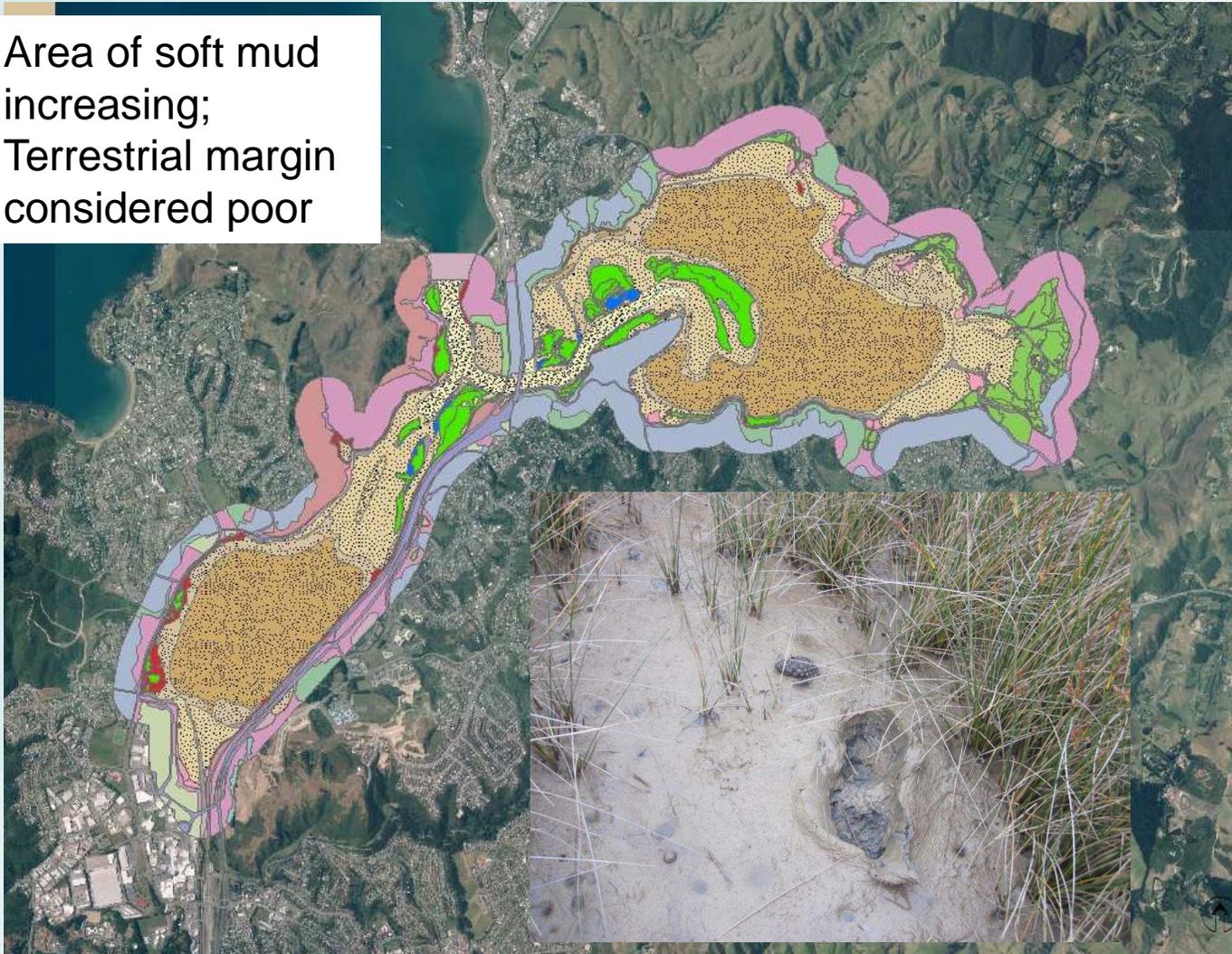
Habitat mapping - seagrass

9% decline in seagrass area between 2008 and 2013



Habitat mapping – substrate and margin

Area of soft mud increasing;
Terrestrial margin considered poor



Native fish values

- High native fish values; 15 species in reasonable numbers but under pressure
- Many sites good for inanga spawning
- Proximity to sea important
- Concrete not a good habitat



Overall summary

- Sedimentation higher in subtidal areas and variable over time;
- Mud content increasing;
- Wet weather events bring in significant pulses of sediment;
- Hotspots of high stormwater-borne contaminants such as copper and zinc;
- Faecal contamination continues to be a problem;



Overall summary cont...

- High native fish values in streams;
- Invertebrate health in streams and the harbour good;
- Stream and coastal water quality poorest in urban areas;
- Seagrass habitat continues to decline and areas of soft mud are increasing.



We are collectively failing to meet the objectives of the Porirua Harbour Strategy



Estuary monitoring

