Effects of the Kaikōura earthquake on rocky reefs

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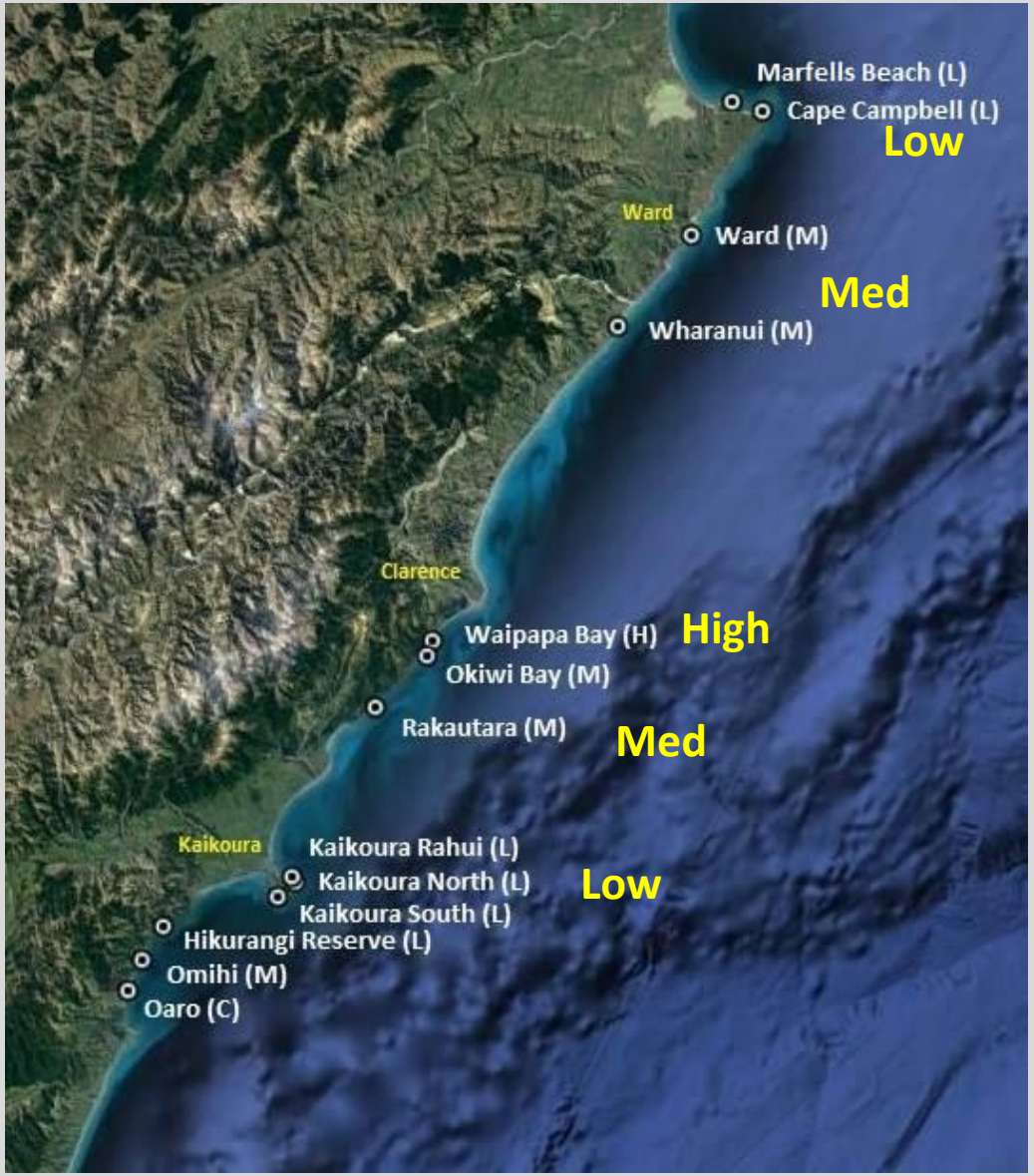
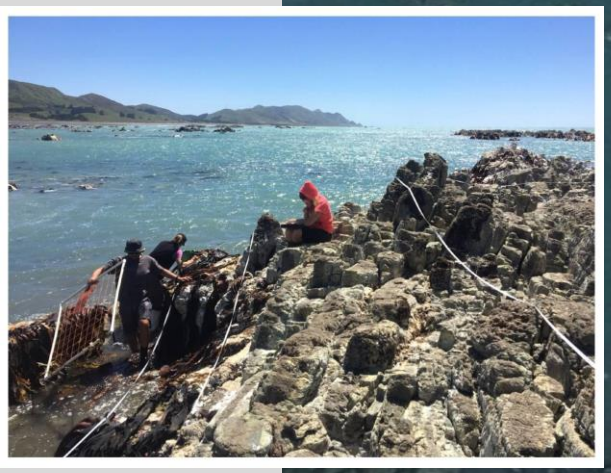
A Big Coast, Degrees of Uplift & Damage

No uplift:: (C- no uplift)
Low uplift: (L - 0.5 to 1m)
Medium uplift: (M – 1.5 to 2.5m)
High uplift: (H – 4.5 to 6.5m)

13 Locations
26 Sites
3 Tidal zones
584,000 data entries



Stratified random sampling
10 x 1m² quadrats per transect



30m

Low

Mid

High

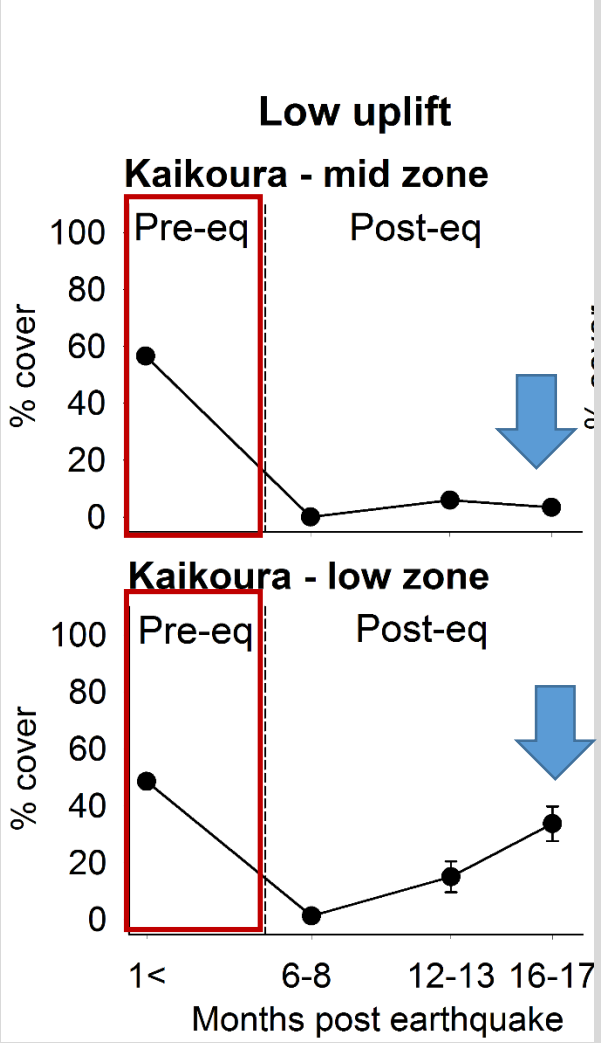
Stratified random sampling
10 x 1m^2 quadrats per transect

WHAT WE COUNTED
All algae (% cover)
All invertebrates (number)

TARGETTED SAMPLING
Juvenile pāua
Juvenile pāua habitat

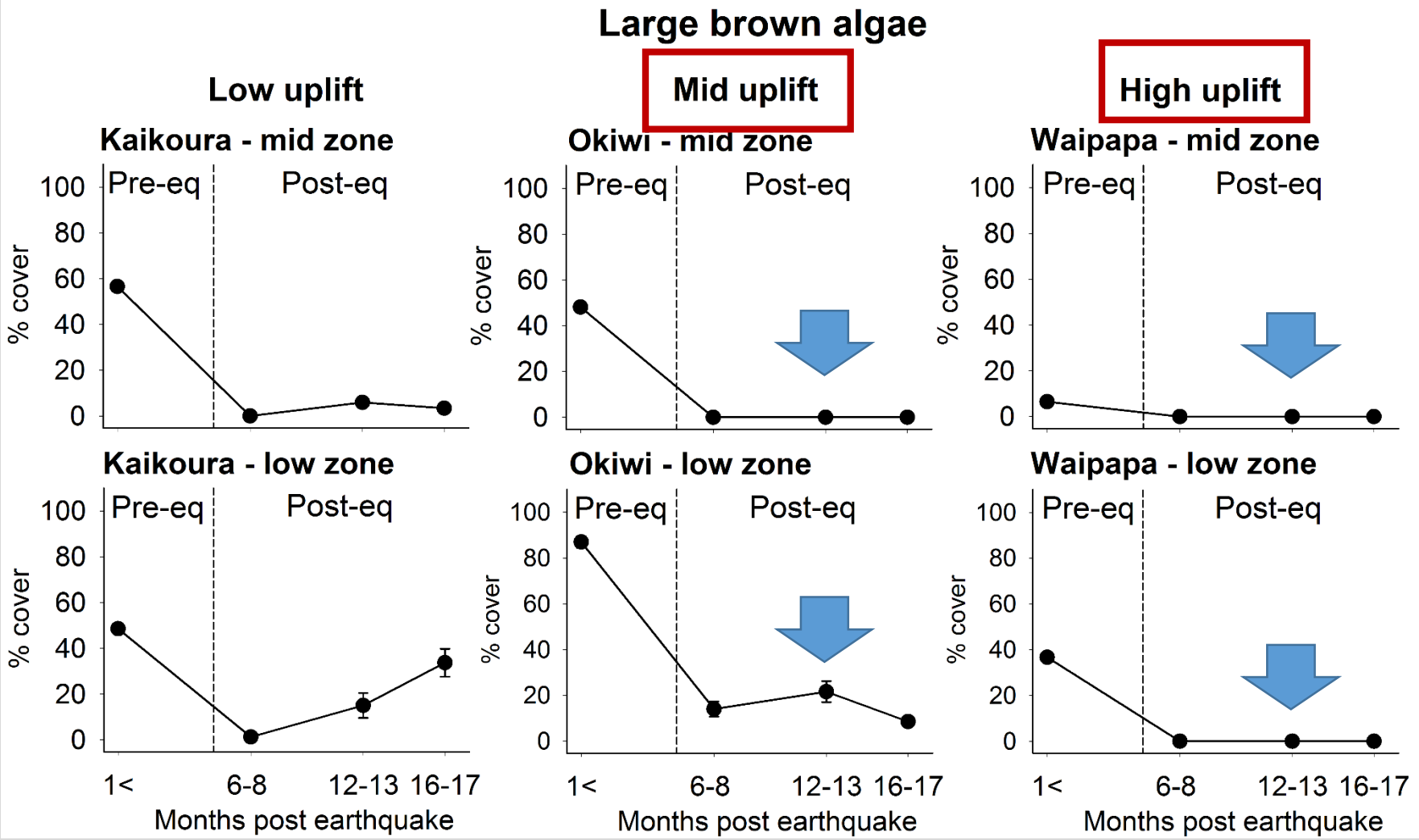
REPRODUCTIVE DYNAMICS
Pāua
Other invertebrates
(Cat's eye snails, limpets)

Large Losses, Little Recovery of Algae



‘Biogenic’ Habitat

Large Losses, Little Recovery of Algae



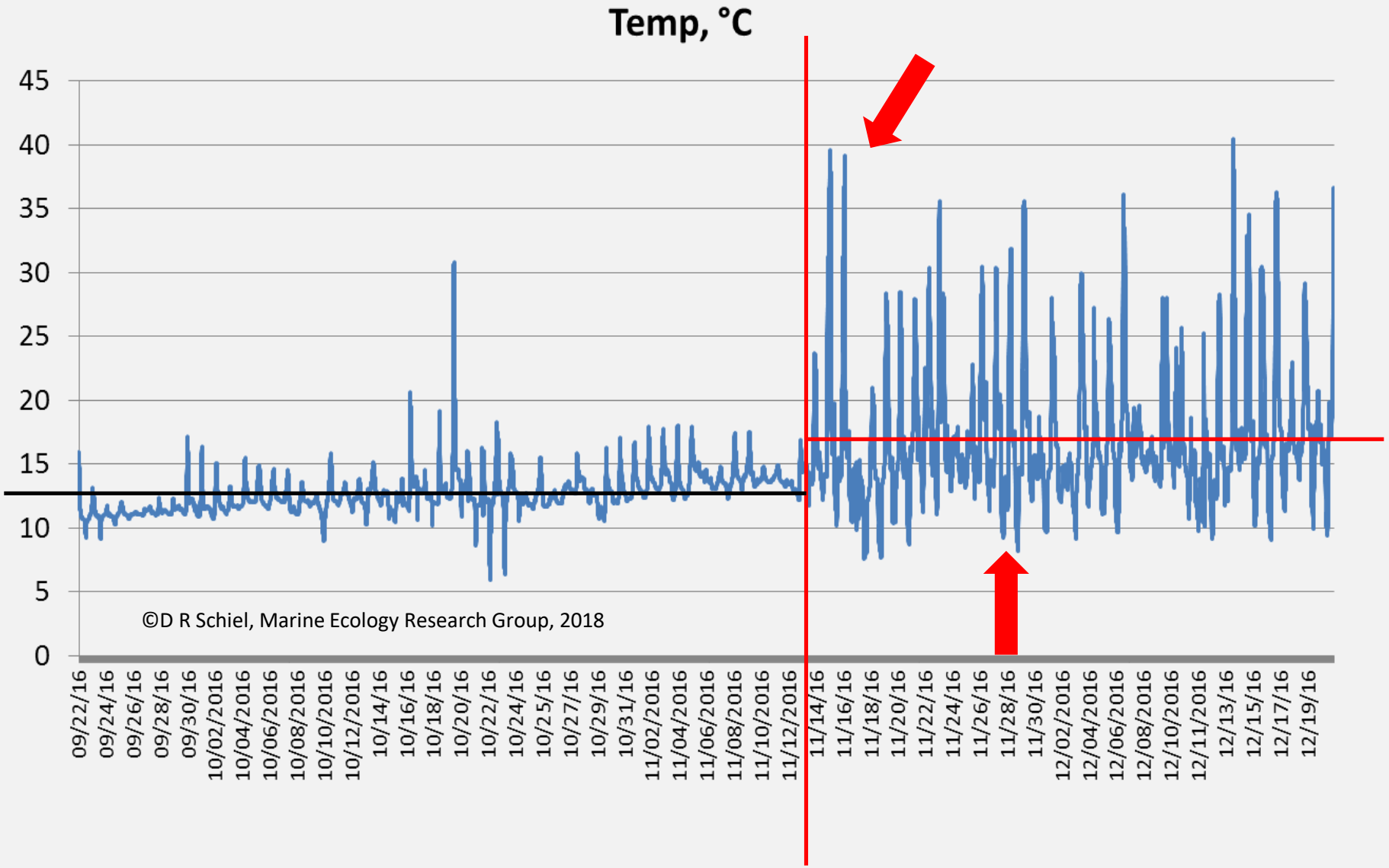
Wairepo Reef, Kaikoura

ICONIC

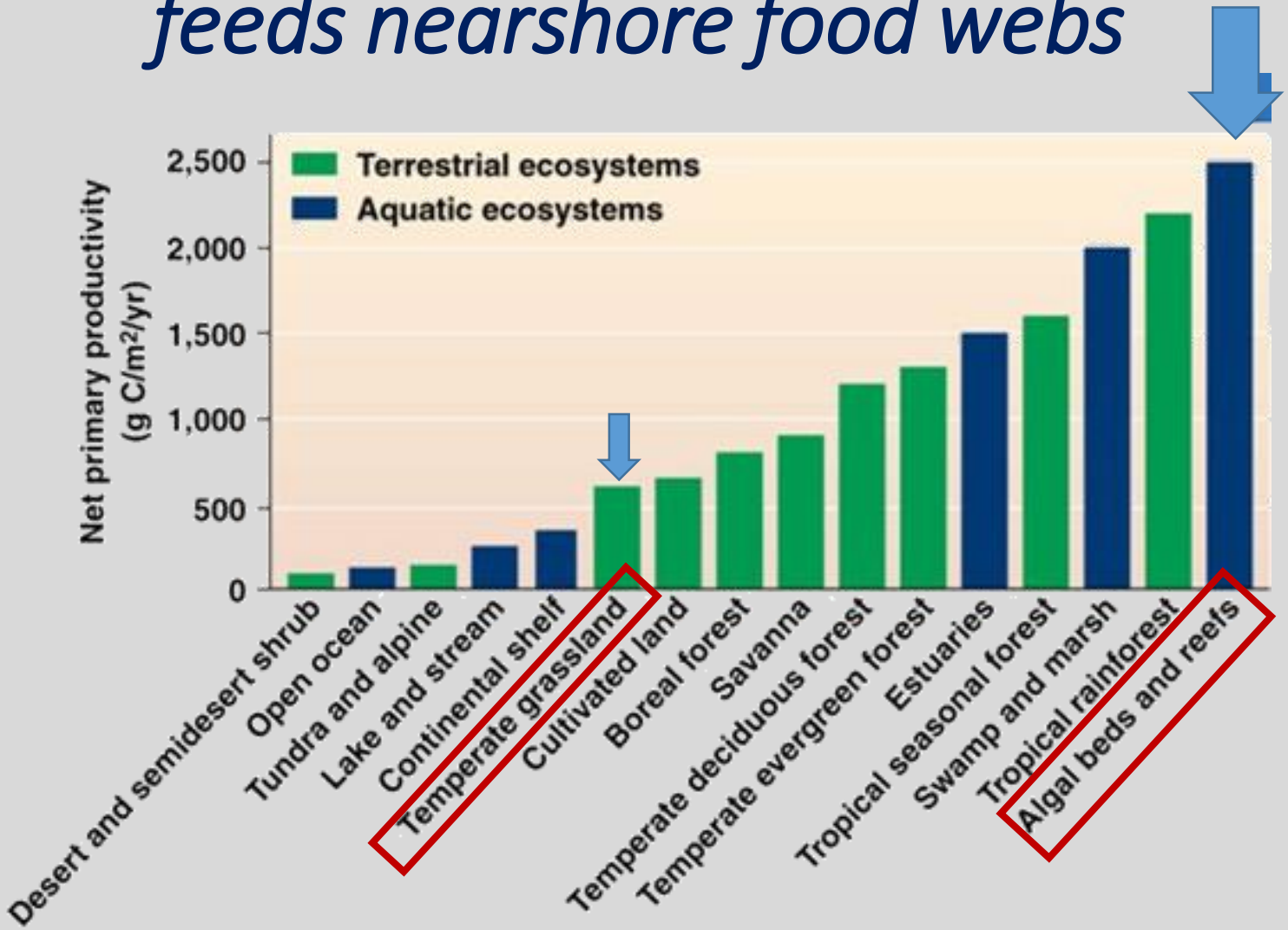
- ***One of most diverse in NZ***
- ***One of most-studied***
- ***Still covered by tide***
- ***Near complete loss of algae***

Wairepo Reef Kaikoura (One of most diverse and studied in New Zealand)

Greatly altered exposure regime



Primary production from algal reefs feeds nearshore food webs



(a) Net primary productivity for major ecosystem types

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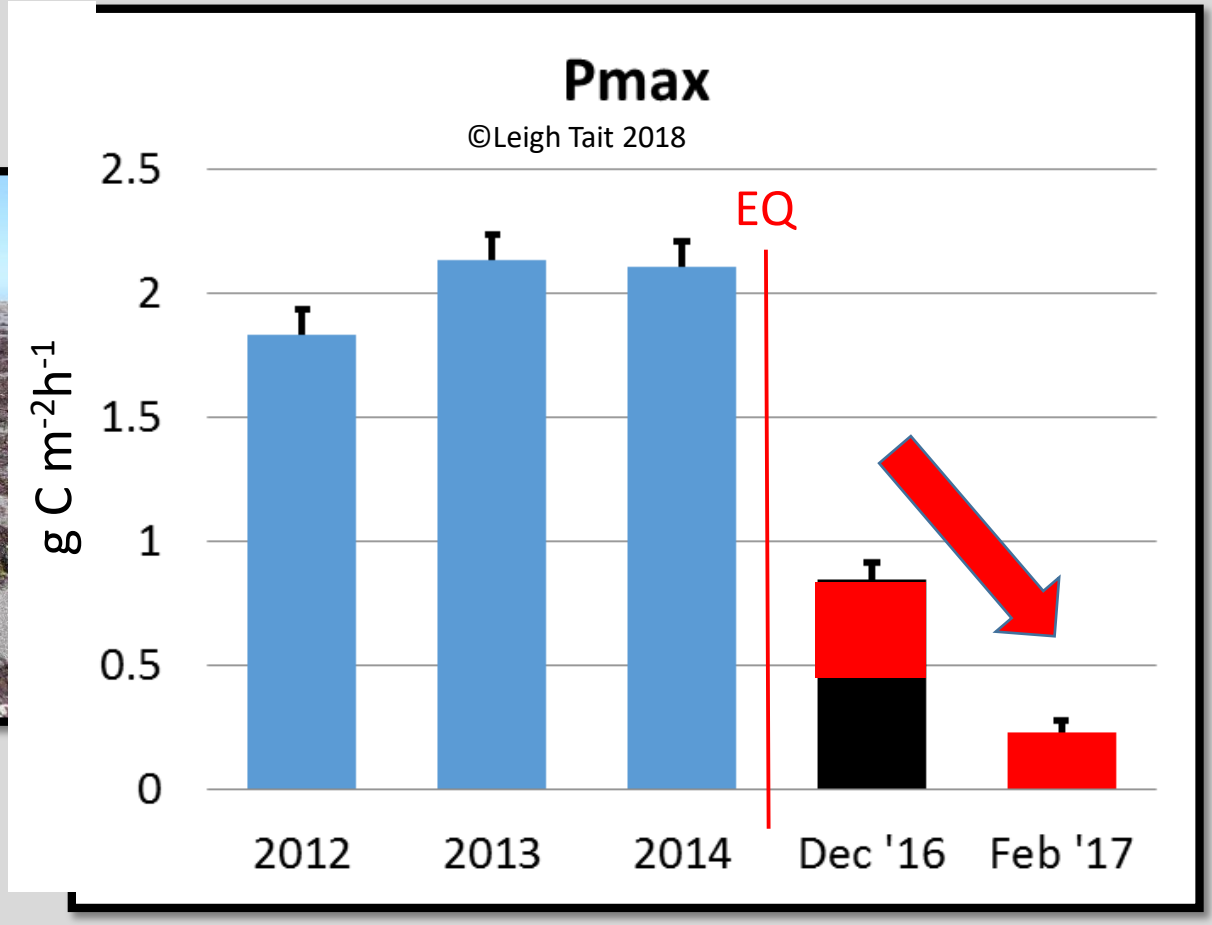
Loss of primary production



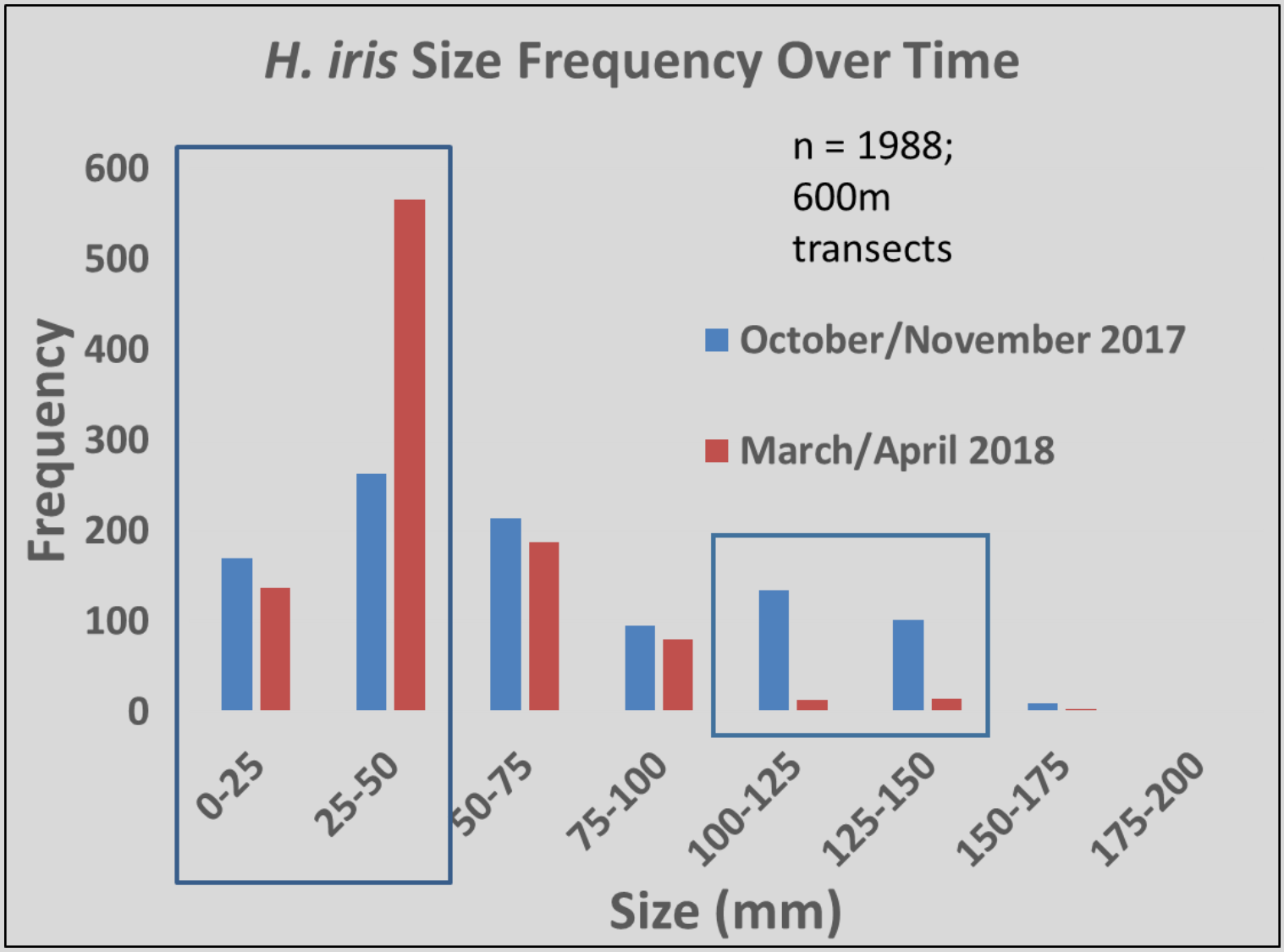
Thanks to Leigh Tait: NIWA

c. 7,500 tonnes of algae lost on coast

c. 1,200 tonnes primary productivity lost annually

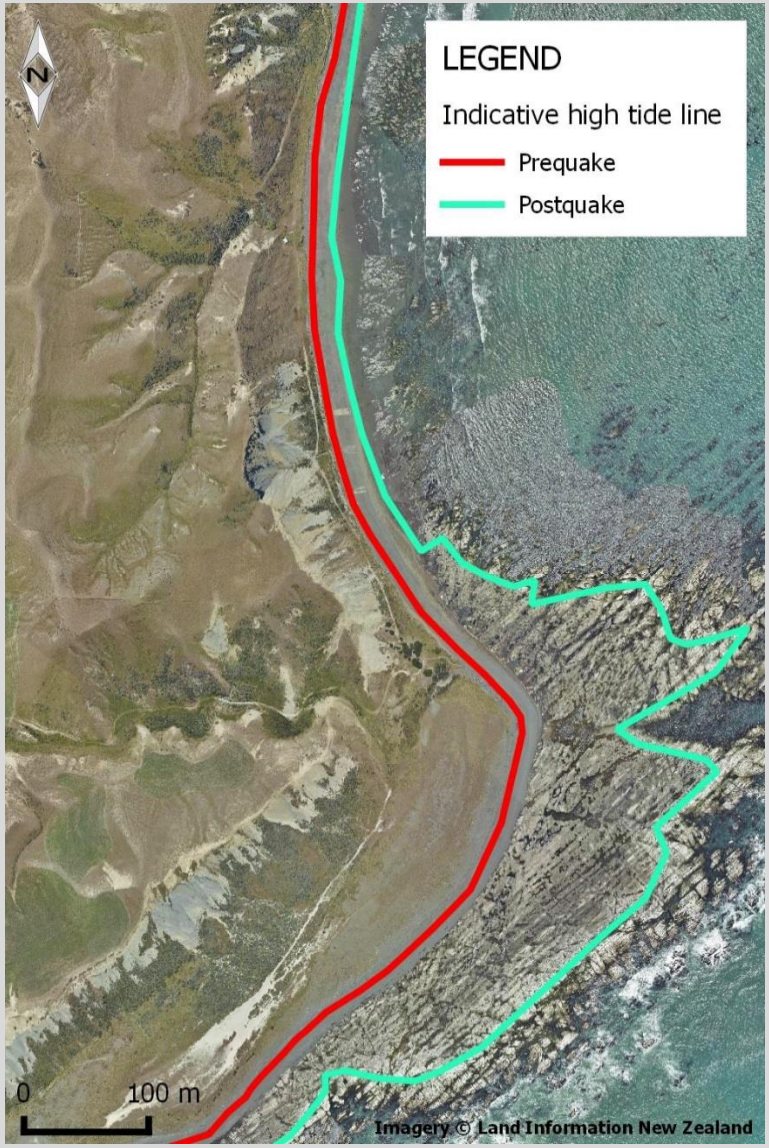
Pāua: targetted habitat

Pāua: targetted habitat



New land, new uses

Horizontal distance between
old and new high-tide marks



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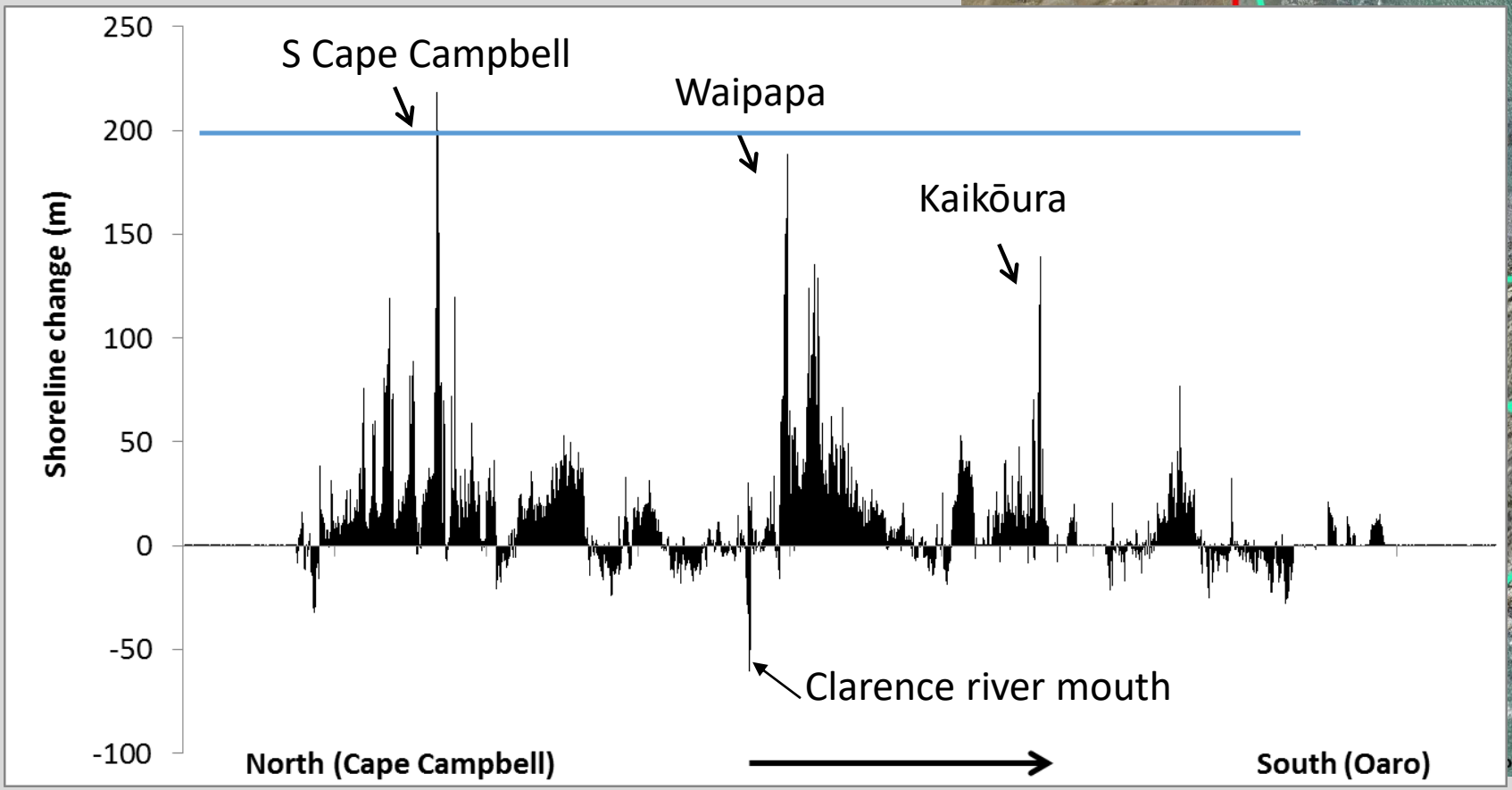
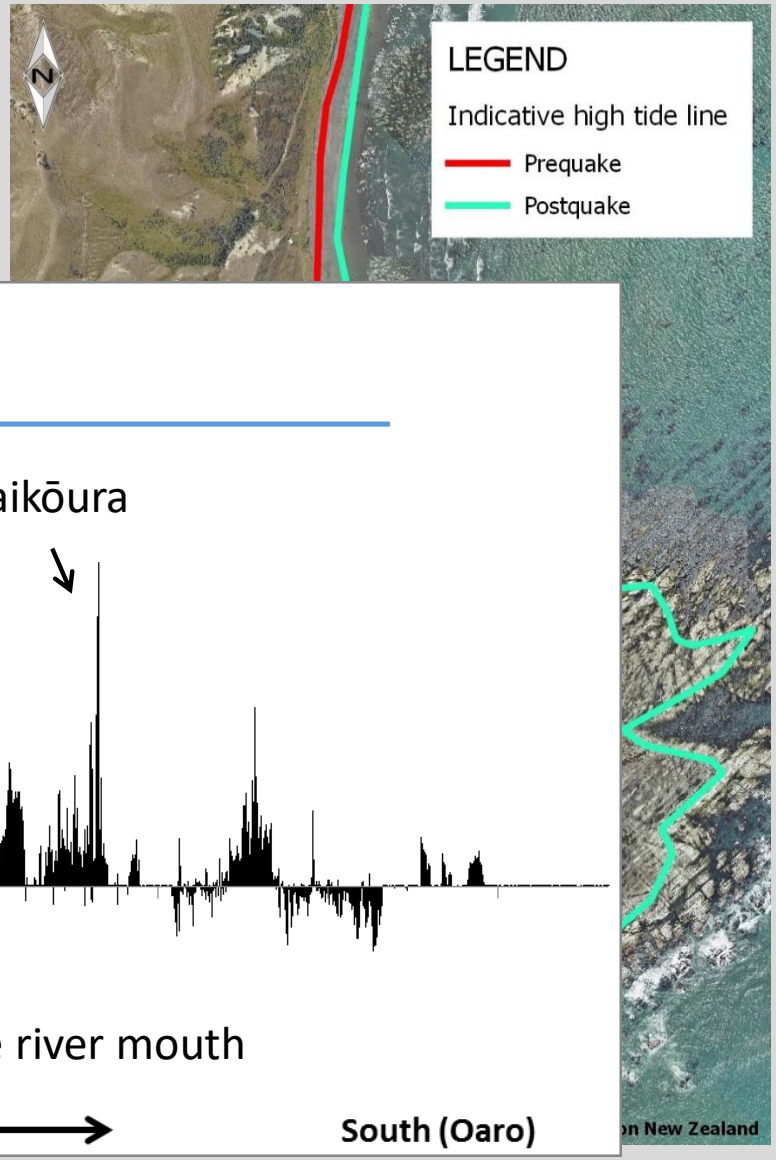


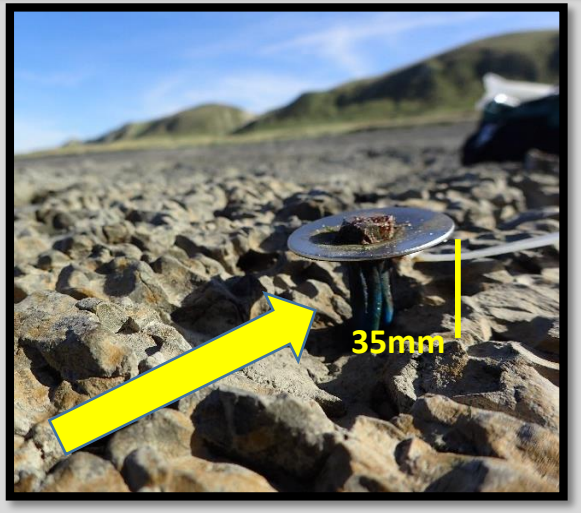


Multiple (and Ongoing) Stressors: Erosion, Weathering and influx of sediments

- Smothering of reefs & loss of habitat
- Prevention of algal and invert recruitment
- Loss of turfs and release of entrapped sediments
- Deterioration of rocks with emersion & weathering

Ongoing cliff erosion and road works

Extreme events flood reefs (Okiwi Bay: Gita)



30 years of erosion in 6 months

Vehicle Access (impacts & added stressors)

Acknowledgements

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