Diversity, values, threats and risks on rocky reefs 1.5 years after the Kaikōura earthquake

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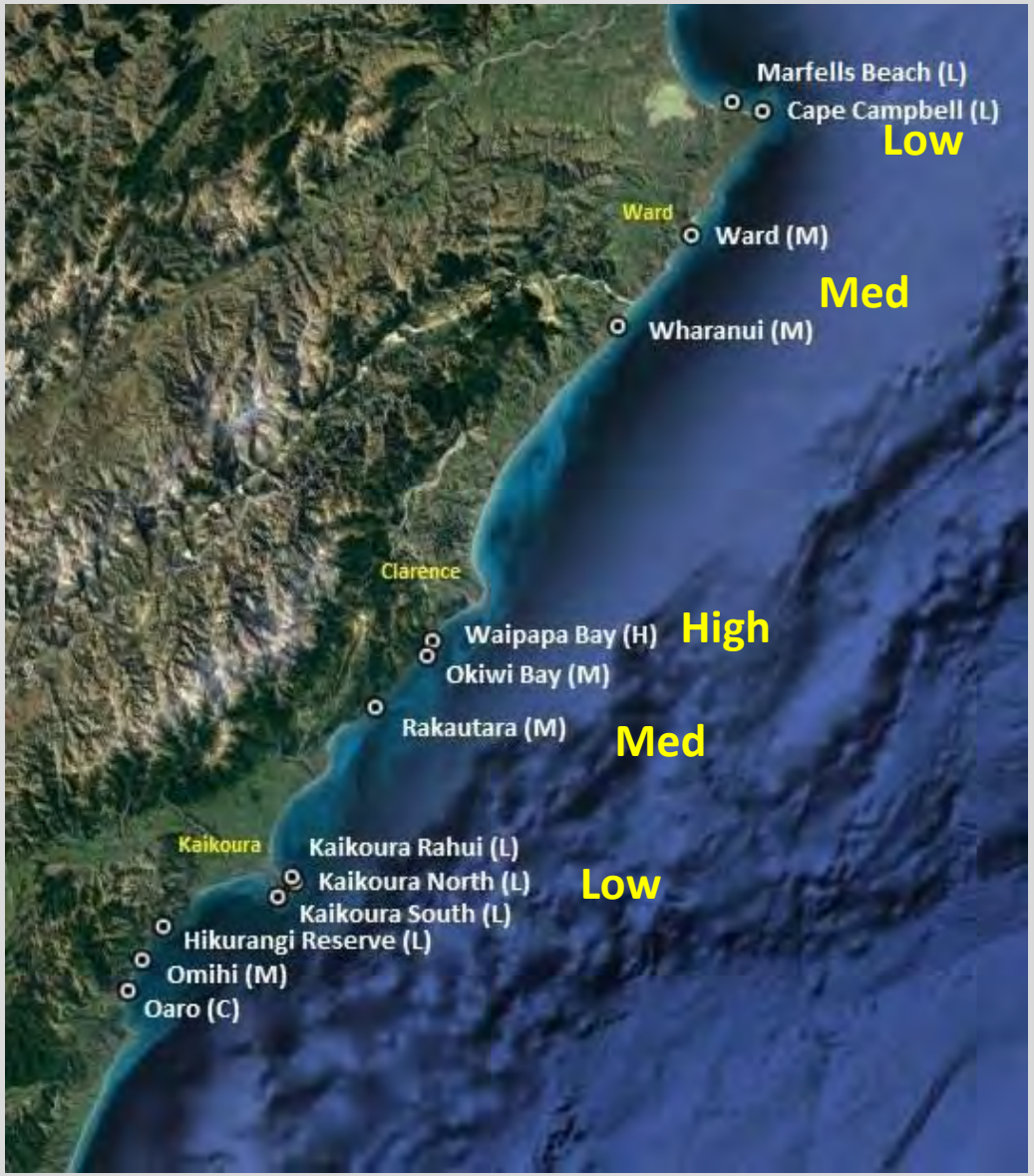
A Big Coast, Degrees of Uplift & Damage

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
What was lost, what was left, total diversity

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

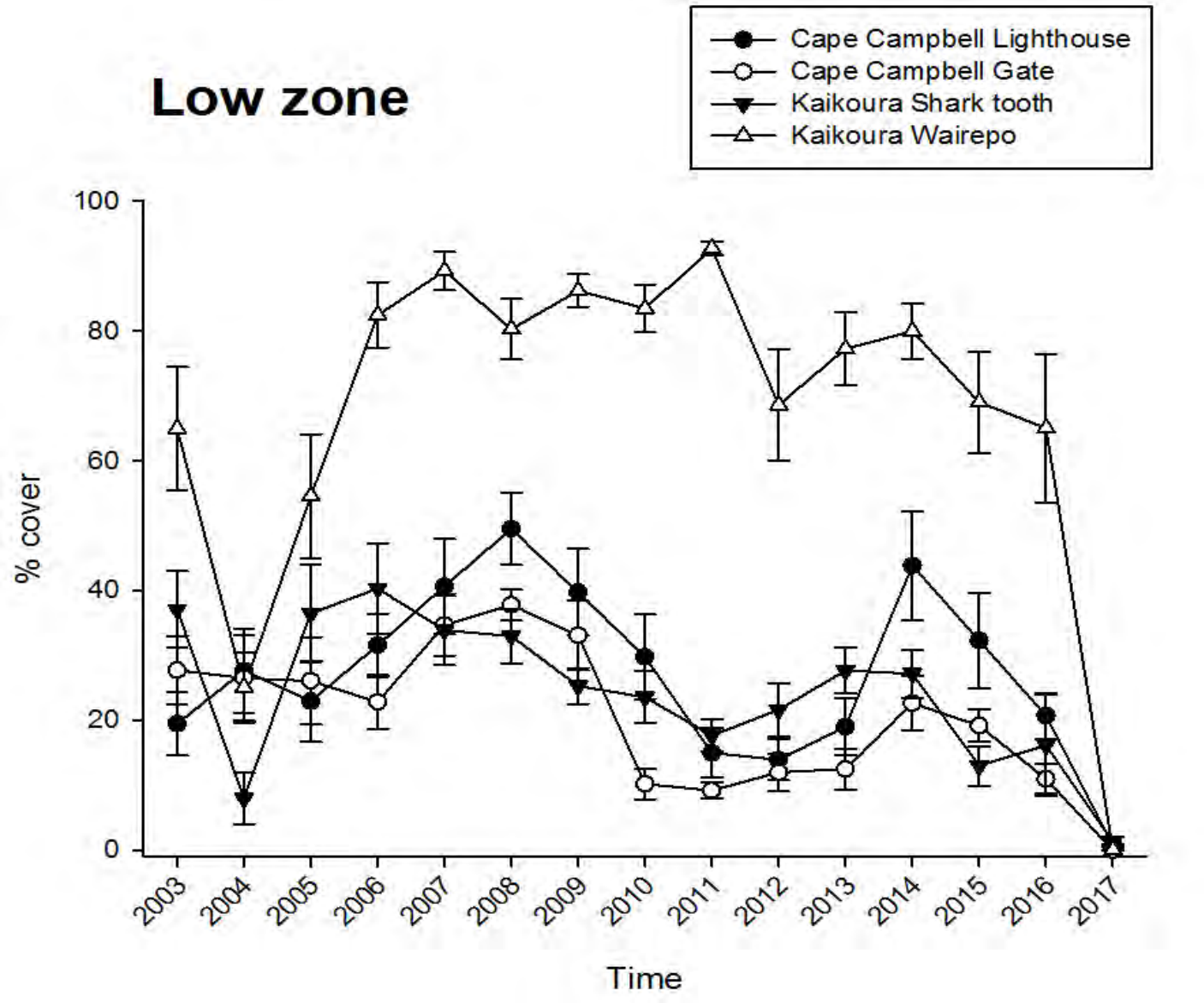
TARGETTED SAMPLING
Juvenile pāua
Juvenile pāua habitat

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

We have been monitoring areas around Cape Campbell since mid 1990s

- High diversity reefs
- Convergence of northern and southern species

Loss of dominant canopy-formers: Time series from Kaikoura & Cape Campbell



Loss of Diversity, Biomass, Food web links

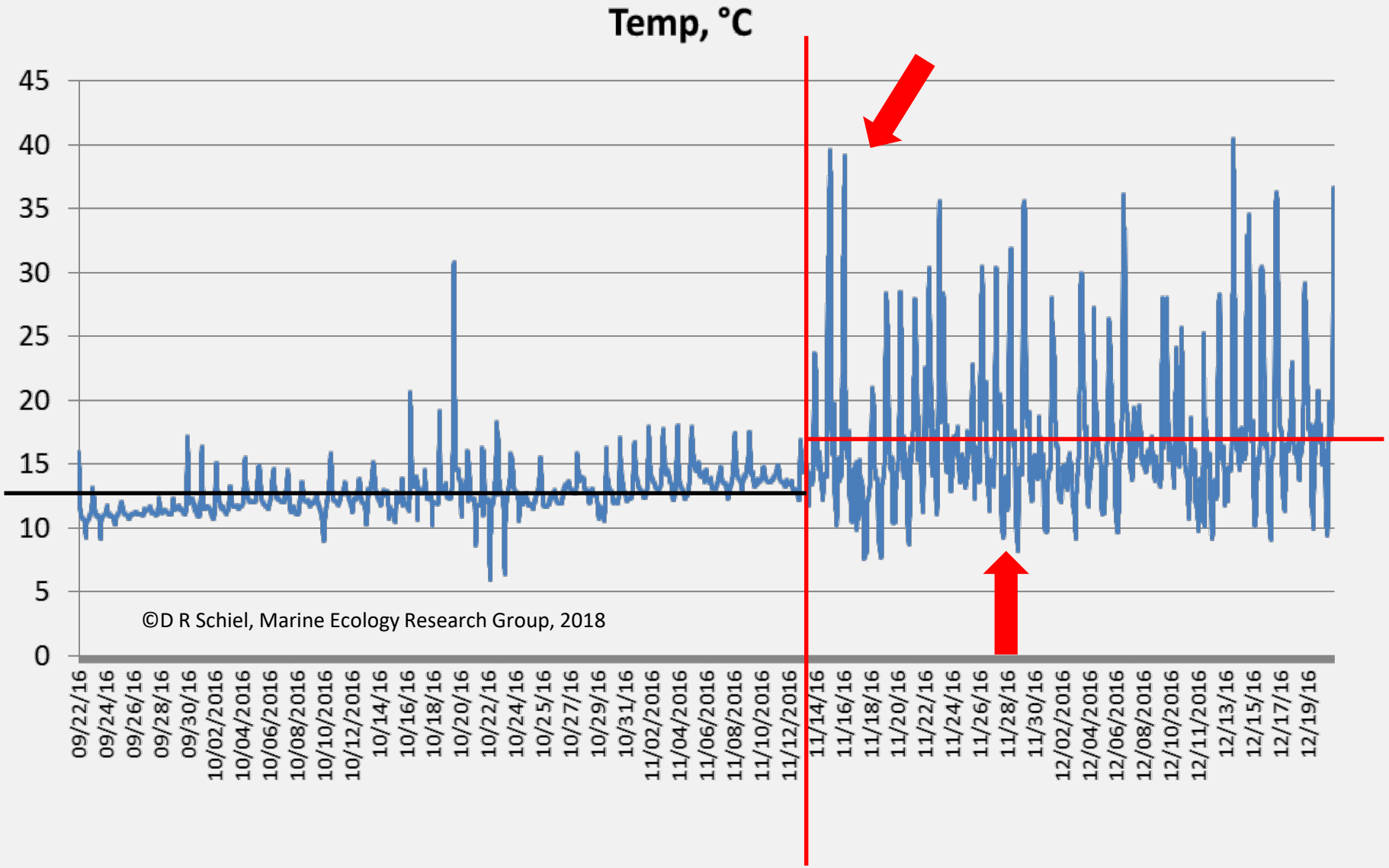
Loss of Diversity

ICONIC

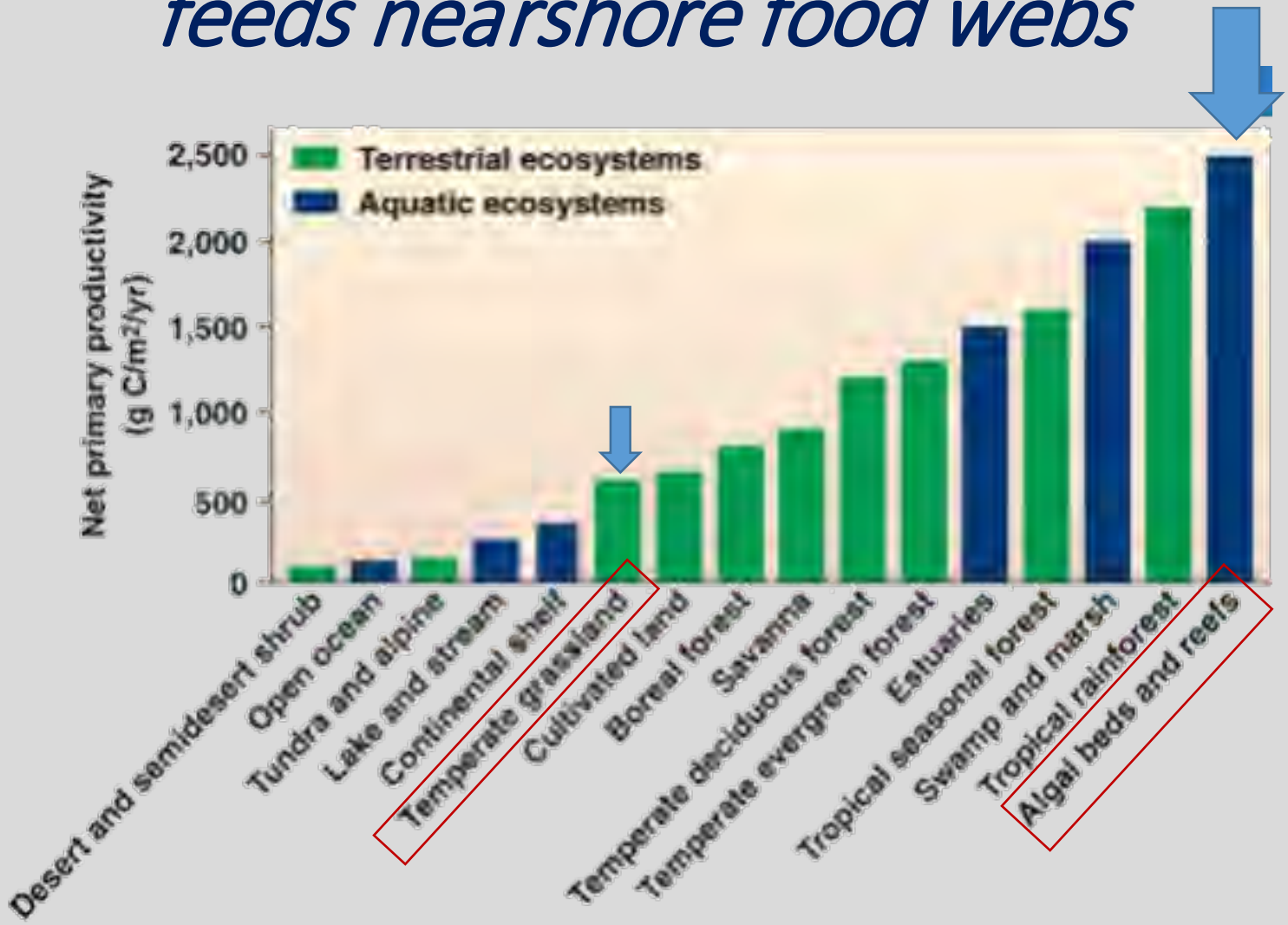
- ***One of most diverse in NZ***
- ***One of most-studied***
- ***Still covered by tide***
- ***Near complete loss of algae***

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

Greatly altered exposure regime

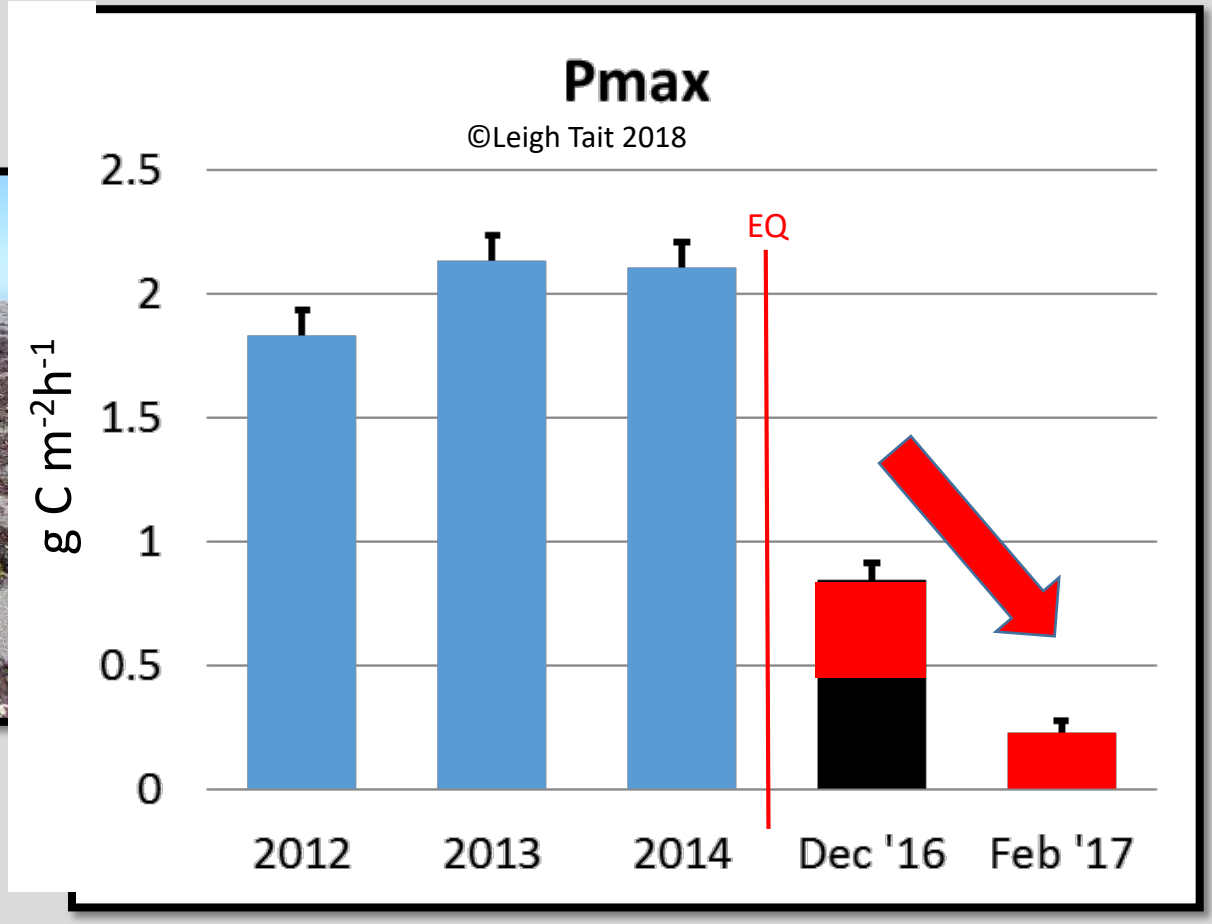


Primary production from algal reefs feeds nearshore food webs



(a) Net primary productivity for major ecosystem types

Loss of primary production



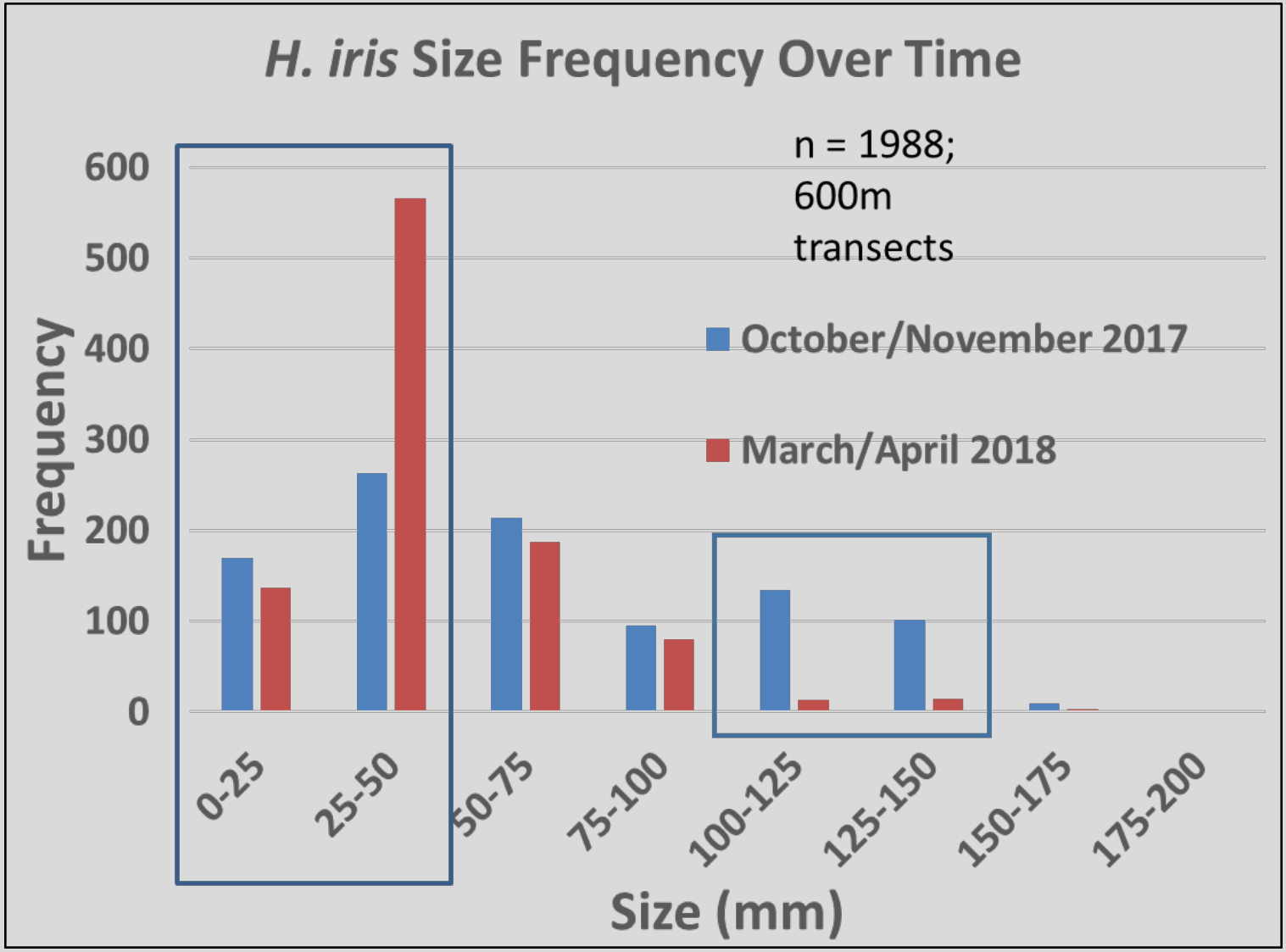
Thanks to Leigh Tait: NIWA

c. 7,500 tonnes of algae lost on coast

c. 1,200 tonnes primary productivity lost annually

Pāua: loss of recruitment and juvenile habitat

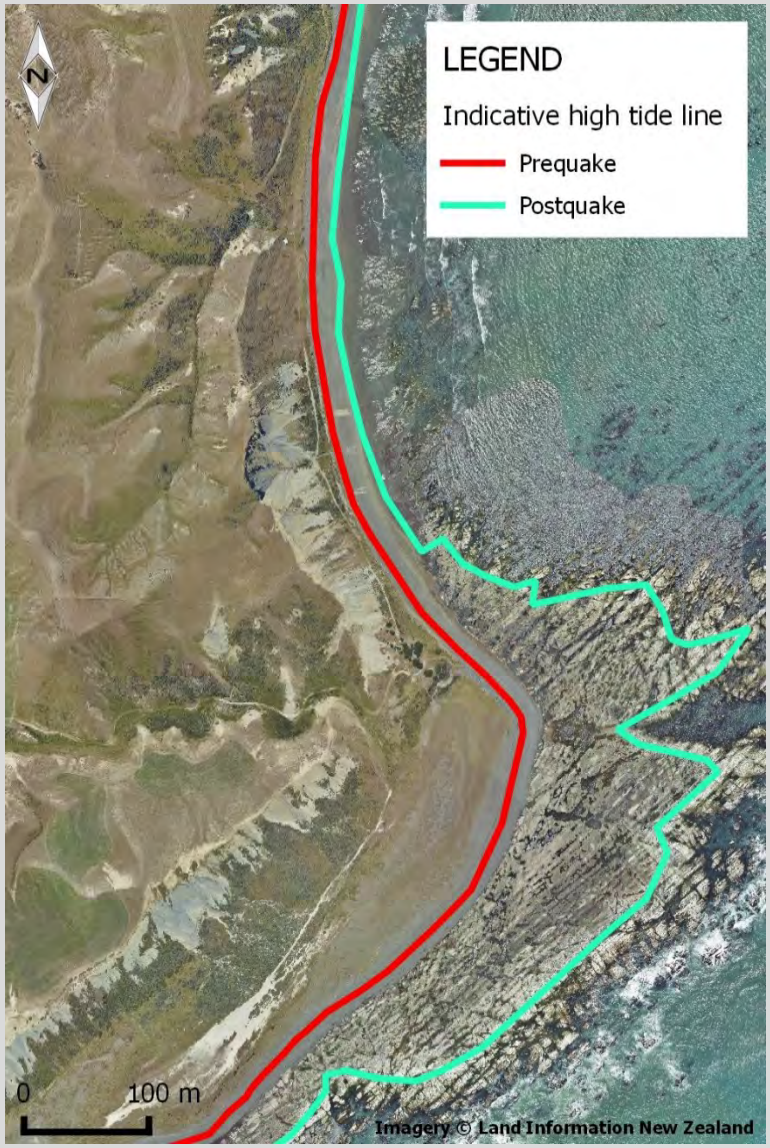
Pāua: recruits, but loss/movement of adults



Pāua remain, but vulnerable

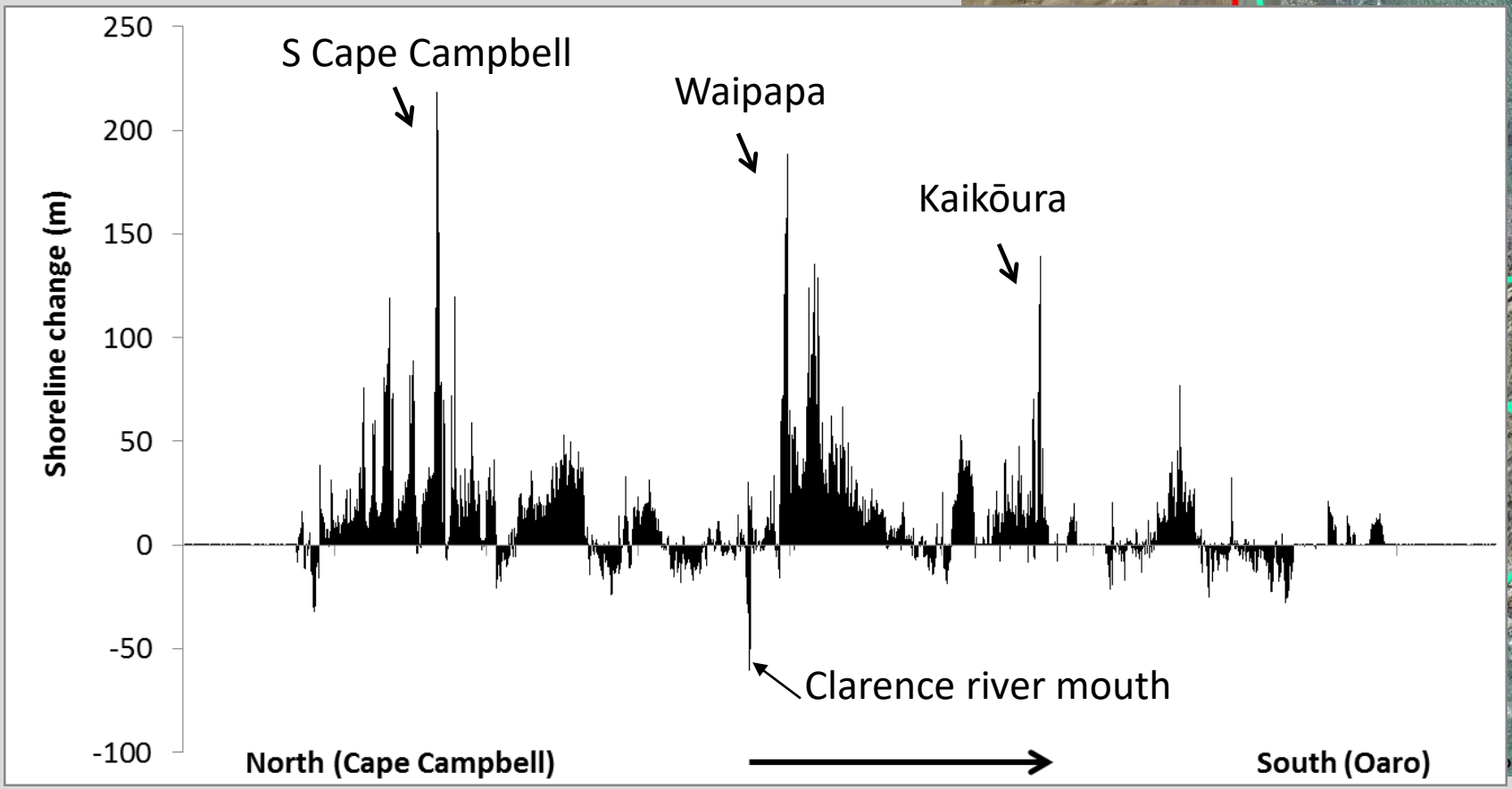
New land, new uses (and risks)

Horizontal distance between old and new high-tide marks



New land, new uses

Horizontal distance between old and new high-tide marks



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)