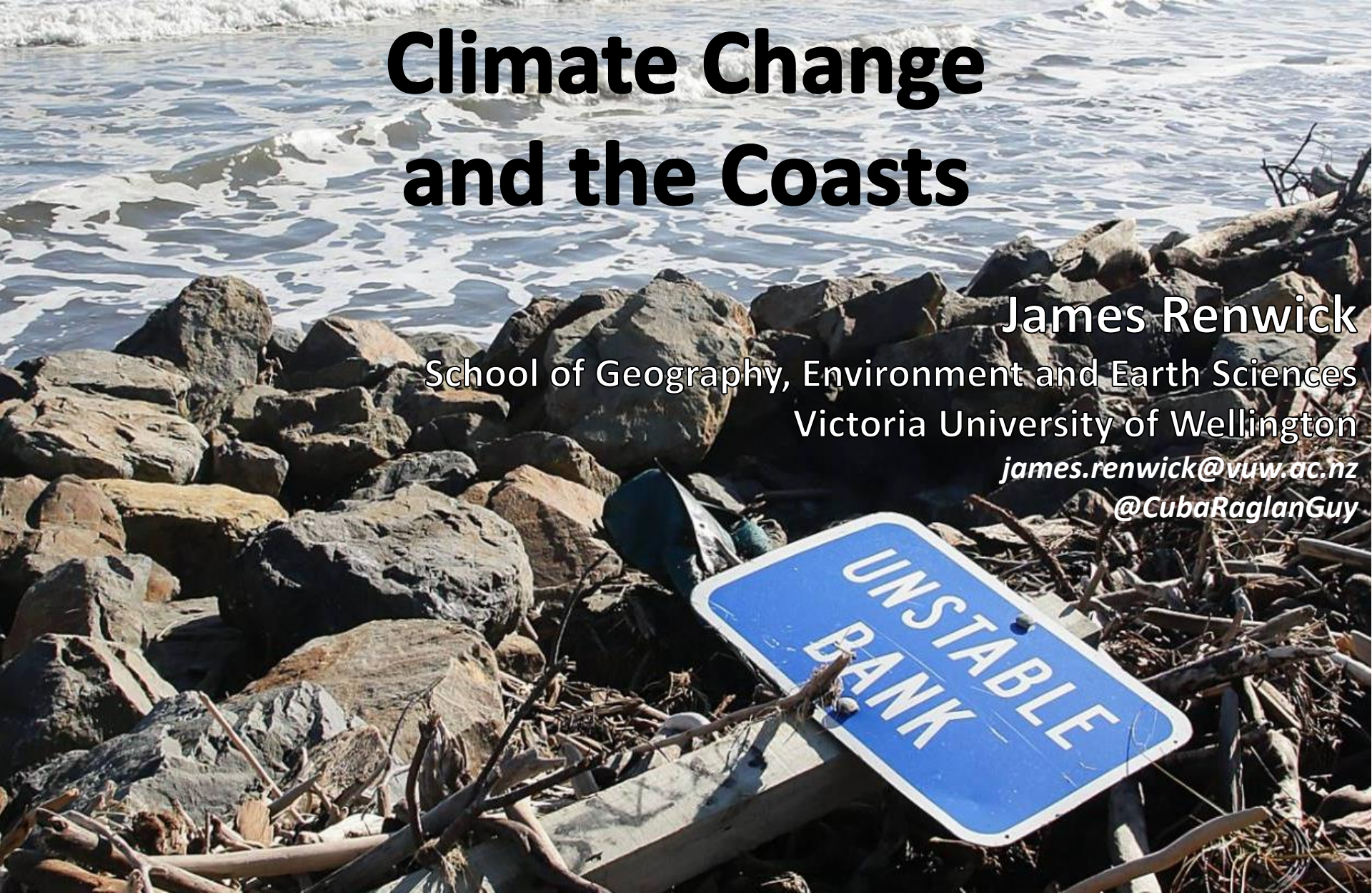
Climate Change and the Coasts



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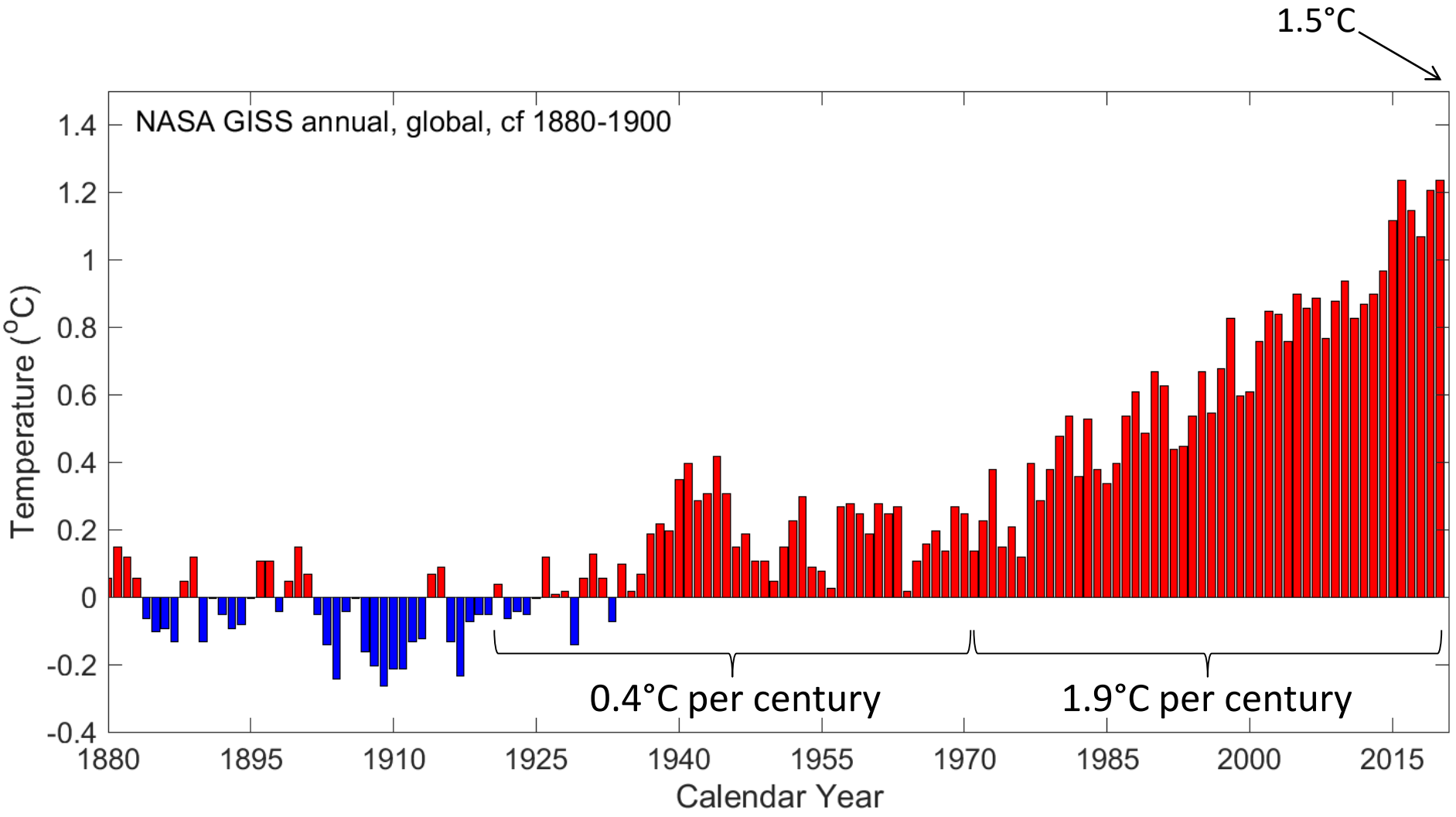
CAPITAL THINKING.
GLOBALLY MINDED.
MAI I TE IHO KI TE PAE

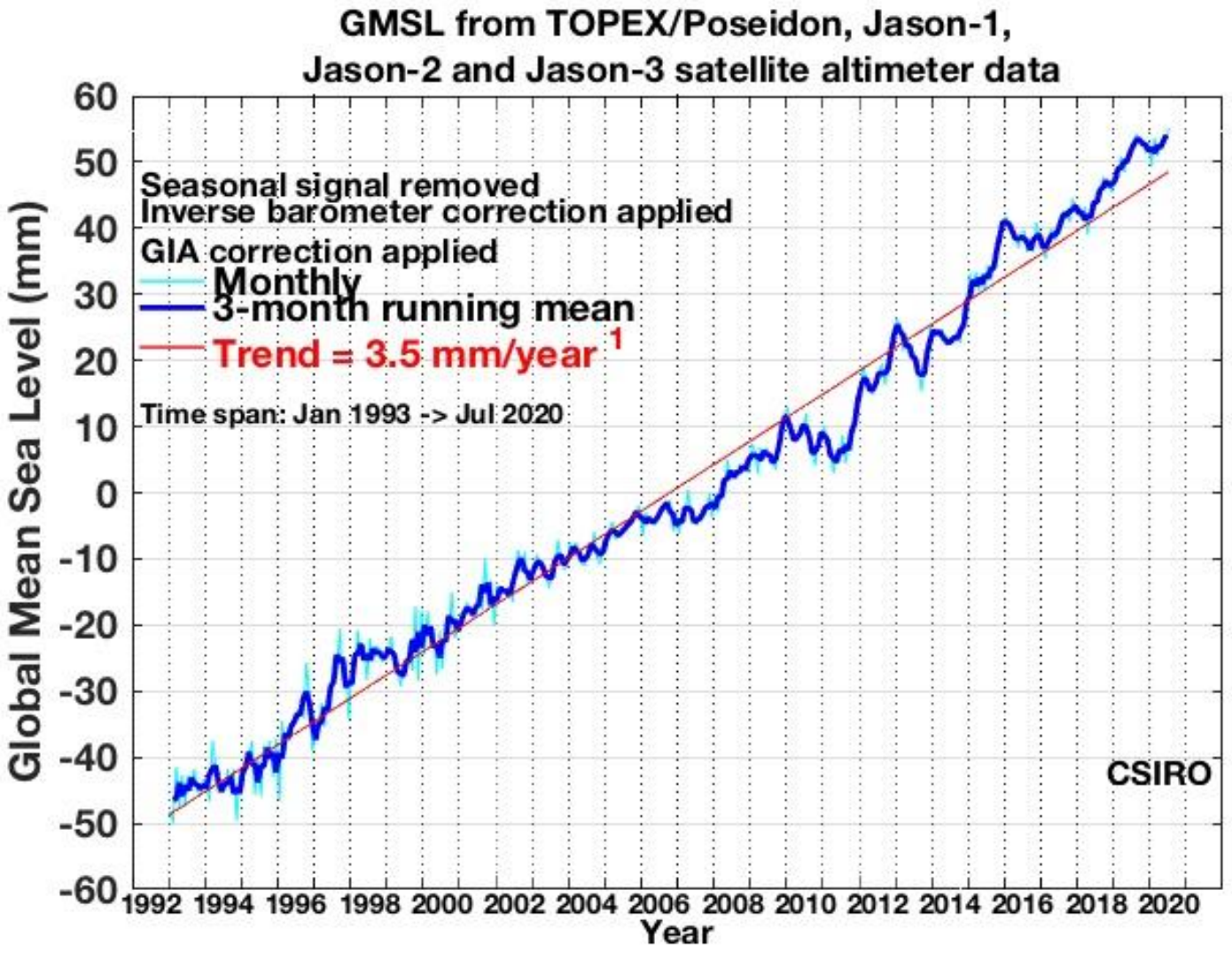
He Pou a Rangi
Climate Change Commission

VICTORIA UNIVERSITY OF WELLINGTON
TE HERENGA WAKA

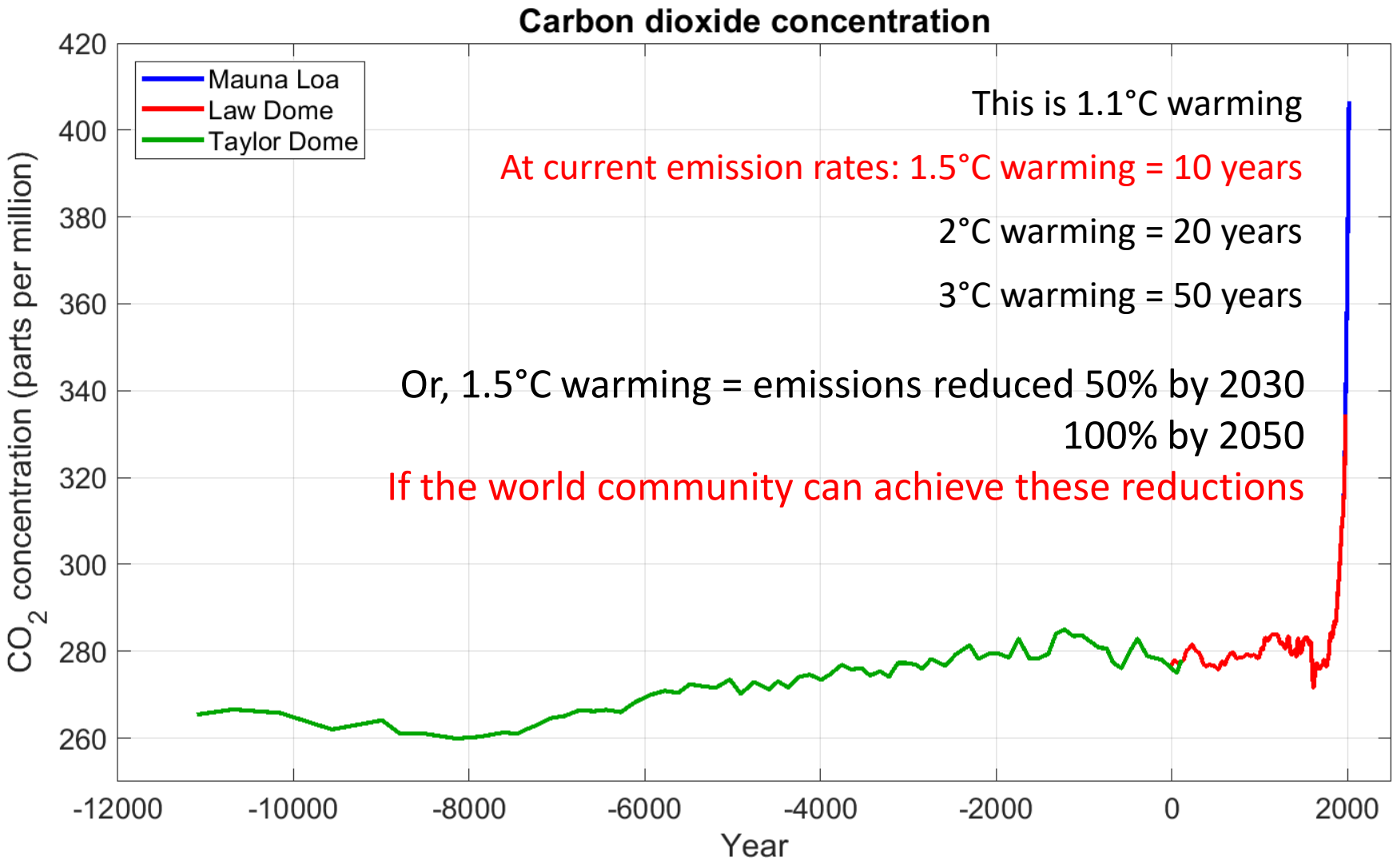
Global warming



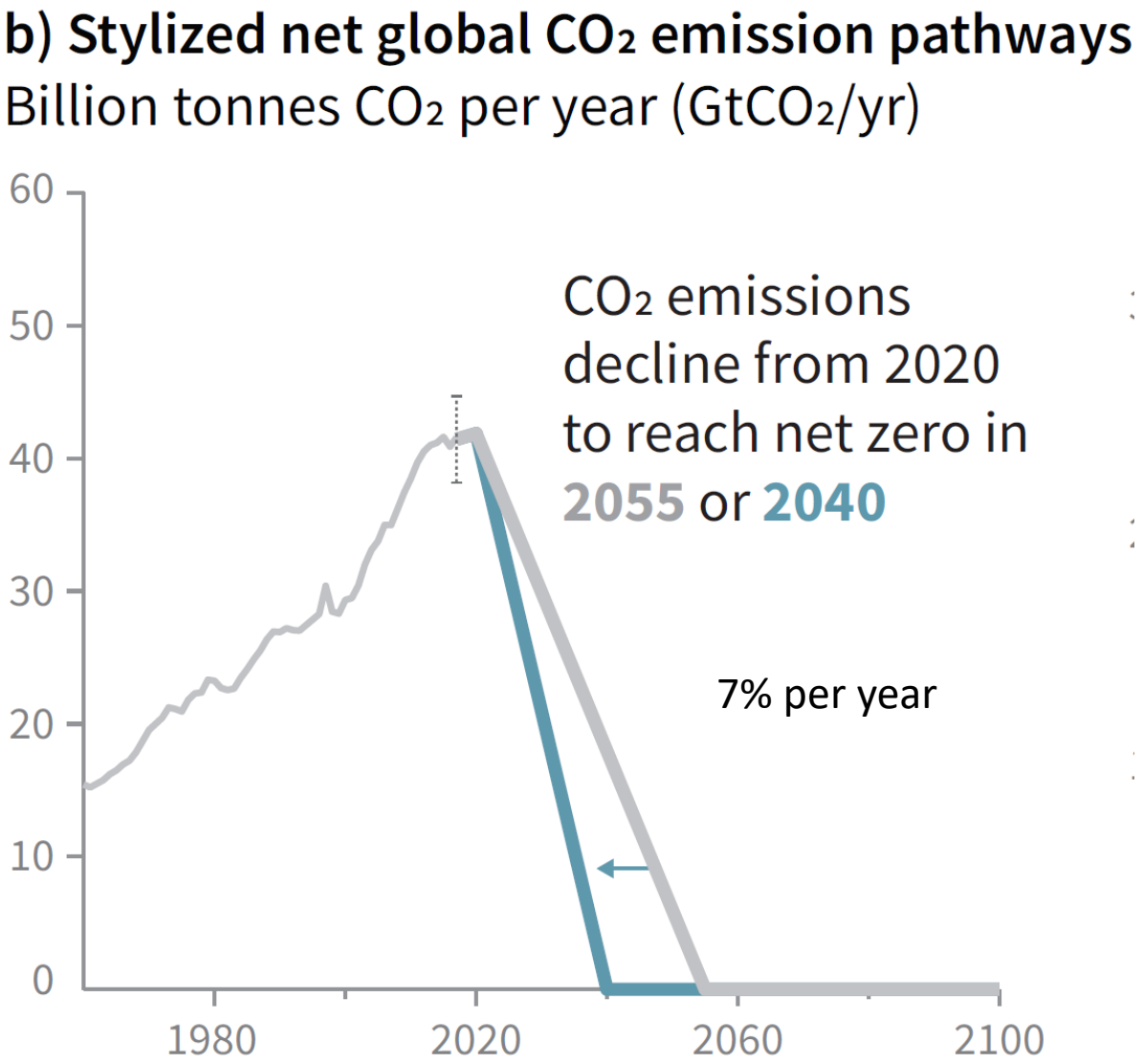
Global sea level



Where to from here?



To stop at 1.5°C warming



https://www.climatecommission.govt.nz/get-involved/our-advice-and-evidence/

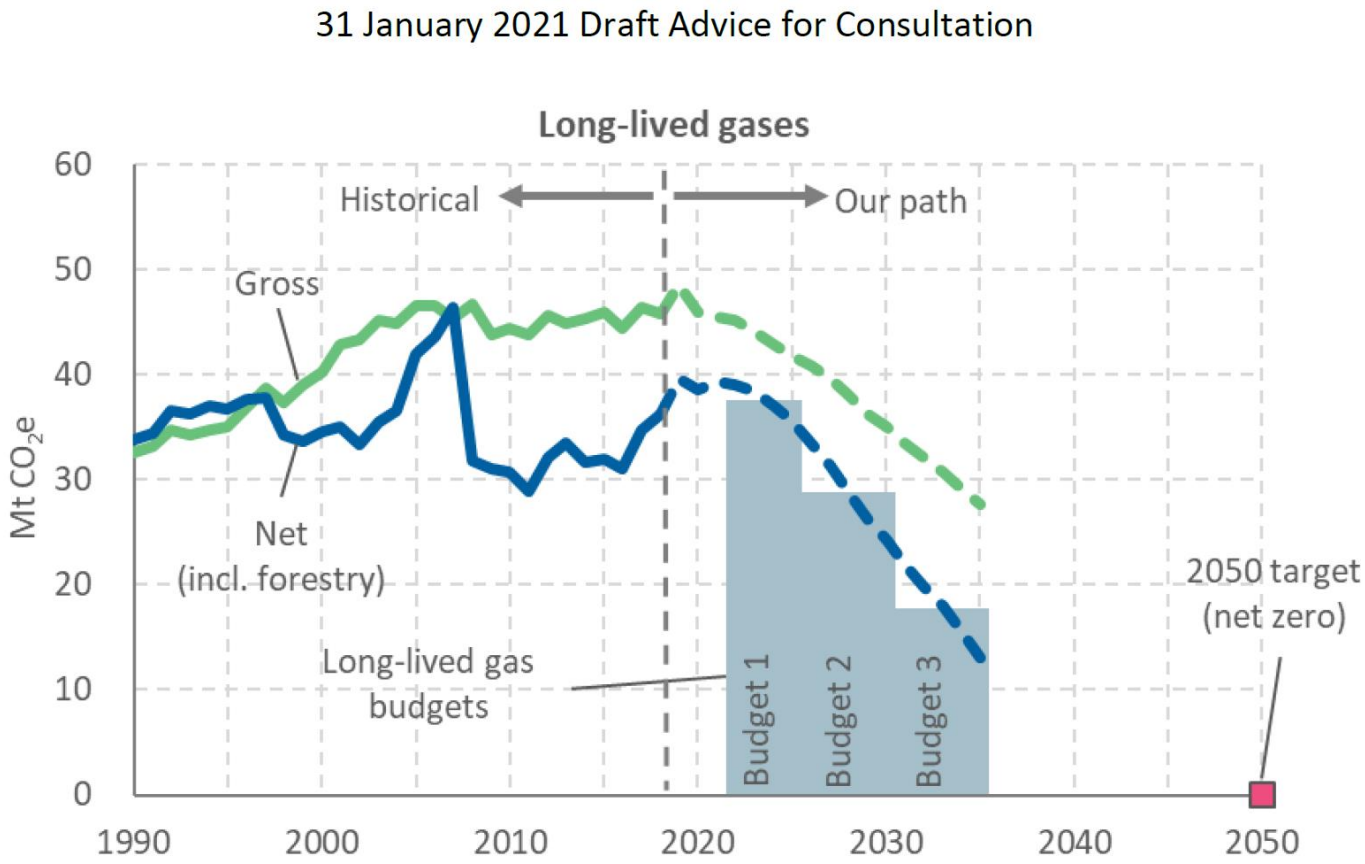
He Pou a Rangi
Climate Change Commission

2021 Draft Advice for Consultation

- Released 30 January
- Consultation period runs to 28 March

https://haveyoursay.climatecommission.govt.nz/

Commission Draft Advice



- Overall goal to get to net-zero CO_2 by 2050
  - Mostly via reducing gross emissions

Aotearoa/New Zealand

- 2°C warming…
  - Tripling number of hot days
- Plus 5-10% less rain…
  - Tripling drought occurrence
  - 4-6 months extreme fire danger, all of eastern NZ

Aotearoa/New Zealand

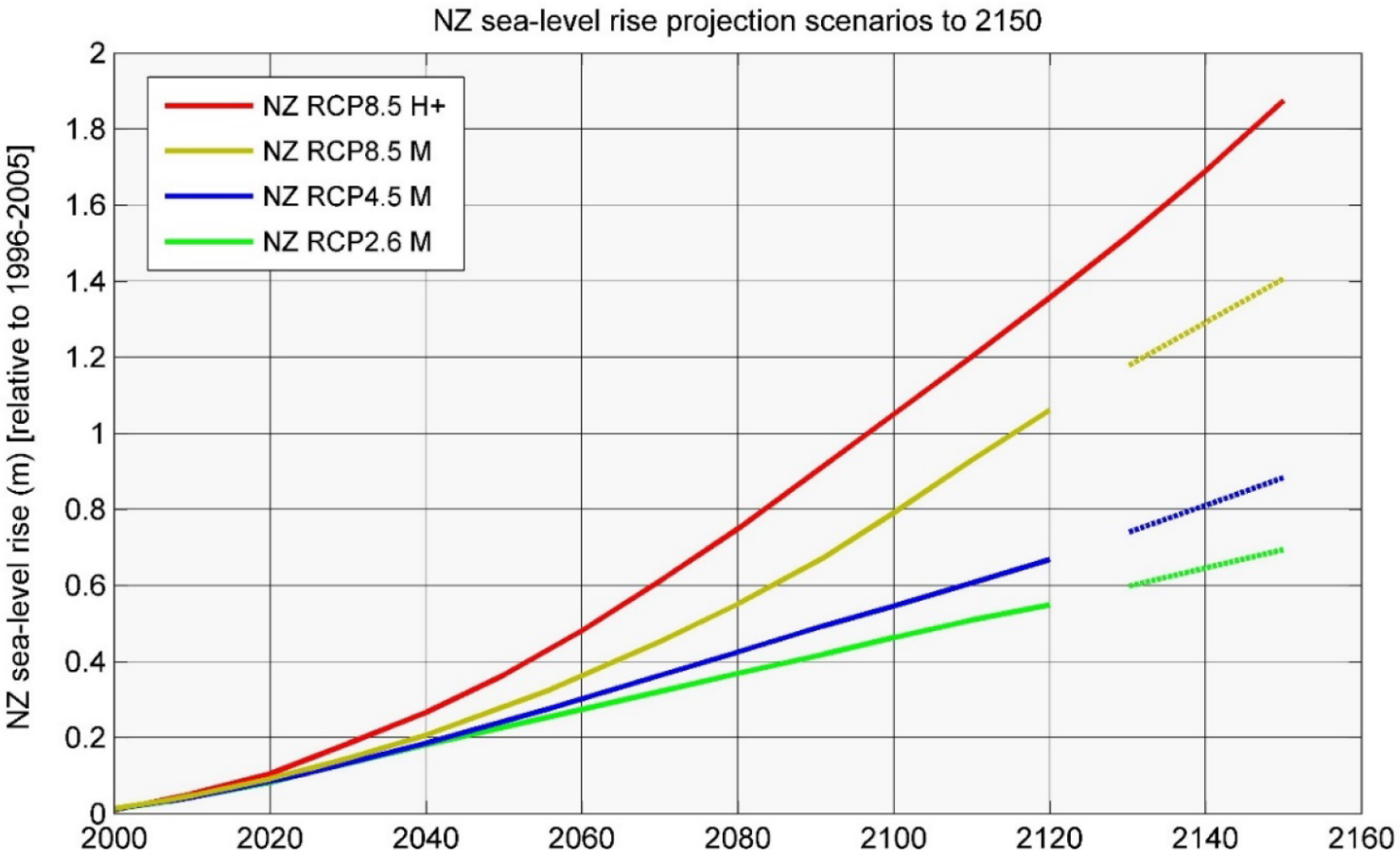
The coasts

ROSS GIBLIN/FAIRFAX NZ

BUILDING BARRIERS: Home made sea walls for coastal properties in Raumati South.

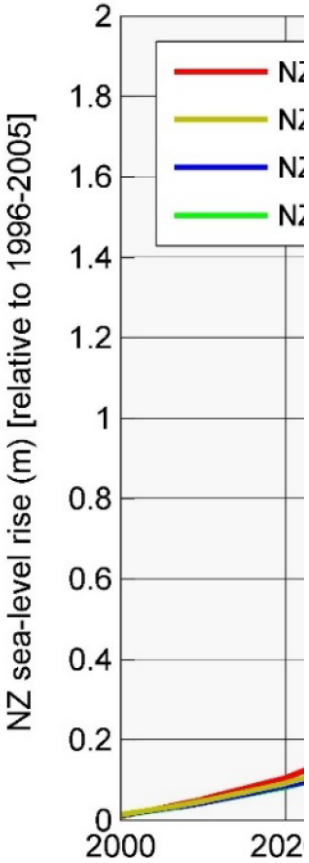
The coasts

Figure 27: Four scenarios of New Zealand-wide regional sea-level rise projections for use with this guidance, with extensions to 2150 based on Kopp et al (2014)

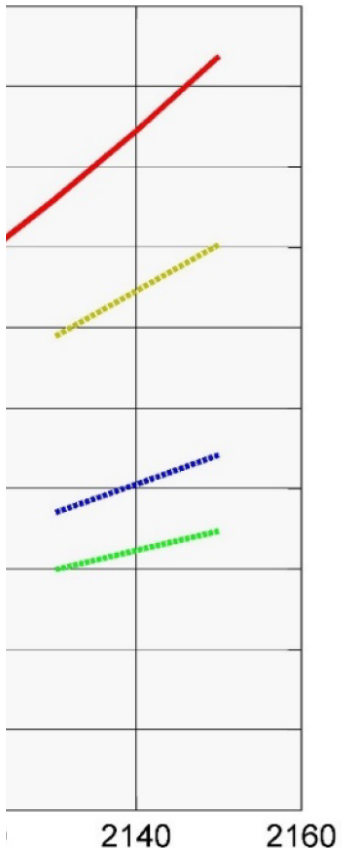


The coasts

Figure 27: **Four sce** **with thi** **projections for use** **et al (2014)**



SLR	Wellington
0cm	Every 100 years
10cm	Every 20 years
20cm	Every 4 years
30cm	Once a year
40cm	Every 2 months
50cm	Twice a month
60cm	3 times a week
70cm	Every tide
80cm	Every tide
90cm	Every tide
100cm	Every tide



BUILDIN

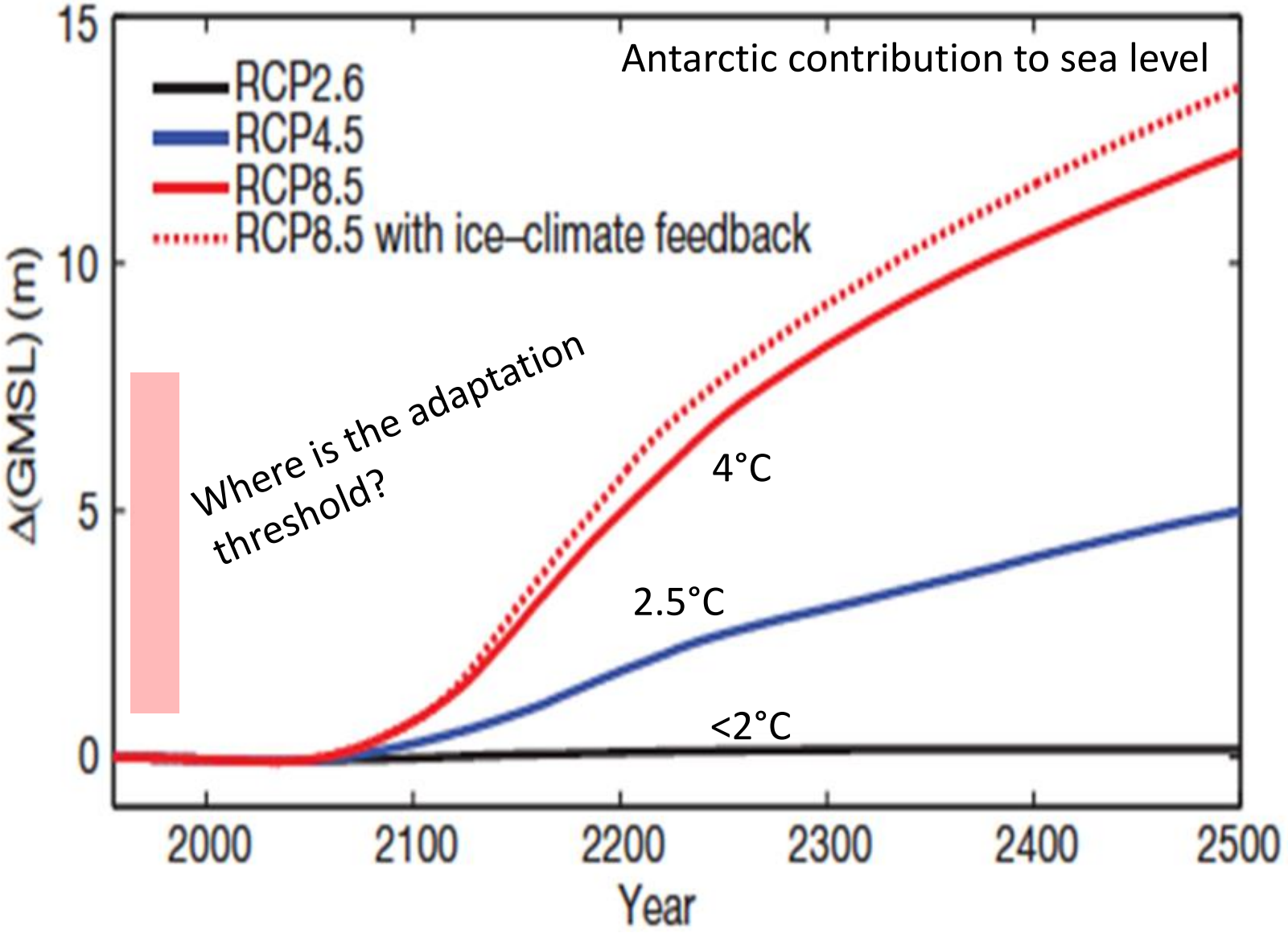
FAIRFAX NZ

The coasts

- Damage to coastal properties & infrastructure
  - Houses, utilities, roading, train lines
  - Every 10cm of SLR triples inundation occurrence
  - Storms likely to be stronger (not more frequent)
- Increased frequency of flooding
  - Higher water table, more ponding
- Response:
  - Coastal restoration
  - Changes to land use
  - Retreat from the coast

Coastal Restoration

Worst case?


Antarctic contribution to sea level
RCP2.6
RCP4.5
RCP8.5
RCP8.5 with ice–climate feedback
Where is the adaptation threshold?
4°C
2.5°C
<2°C
Δ(GMSL) (m)
15
10
5
0
2000
2100
2200
2300
2400
2500
Year

Summary

- Climate change and sea level rise are happening
  - Impacts are just beginning
- Overall amount of sea level rise governed by speed of action on emissions reductions
  - Best case less than one metre
    - Zero carbon by 2050, globally
  - Worst case two metres in 100 years, 10+ metres eventually
    - Increasing emissions through 21st century
- Coastal restoration, coastal protection vital
  - Critical to reduce GHG emissions to avoid overwhelming change