

What does the
Climate Emergency mean
for Port Phillip & Bayside?
How do we respond locally?

FLOOD HEAT, FIRE & FLOOD HEAT, F



PORT PHILLIP
EMERGENCY
CLIMATE
ACTION
NETWORK

BCCAG
BAYSIDE CLIMATE EMERGENCY ACTION GROUP



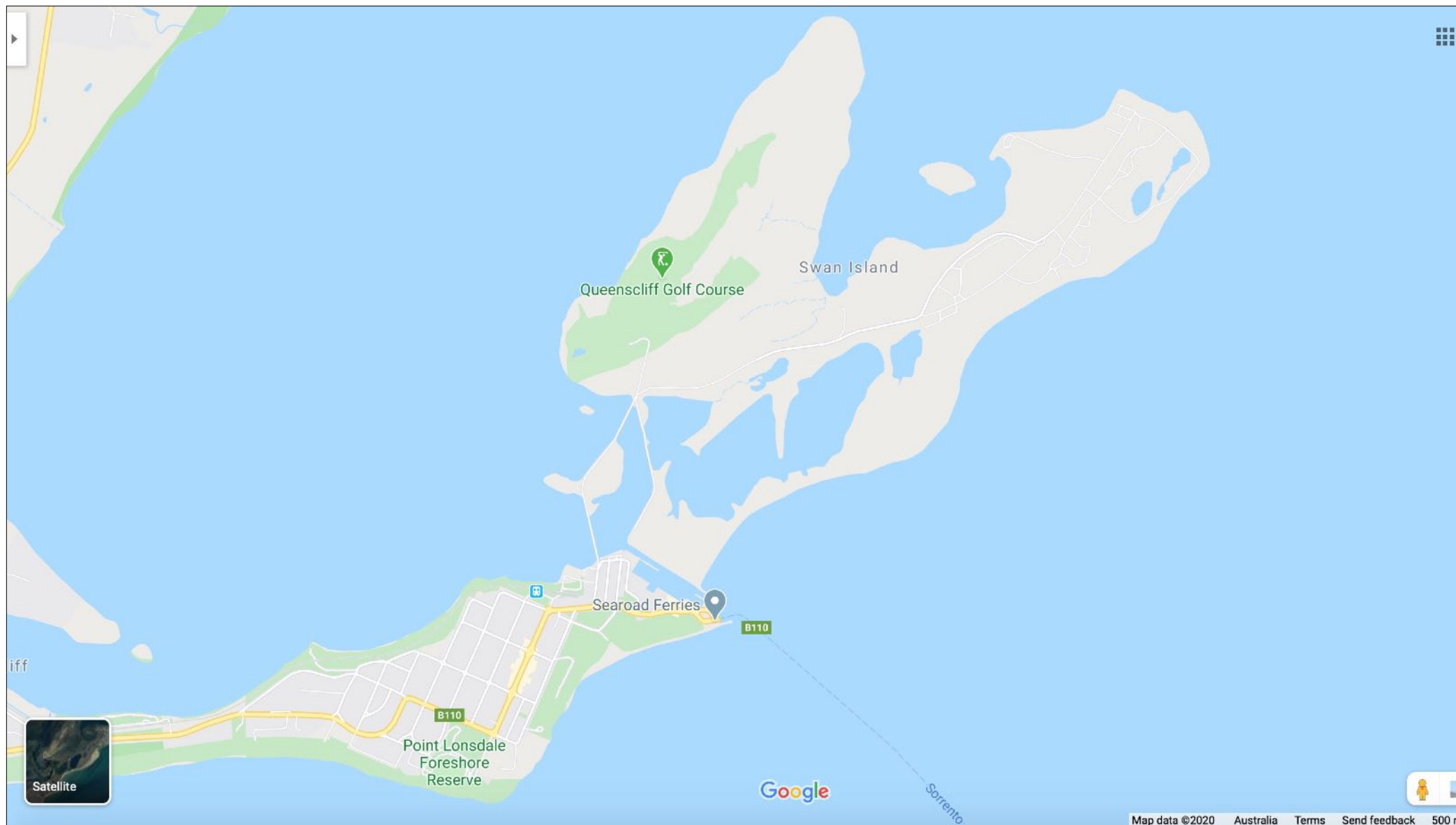
Community Forum
3.30pm Sat 29 February
Phoenix Theatre Elwood College,
Glenhuntly Road.

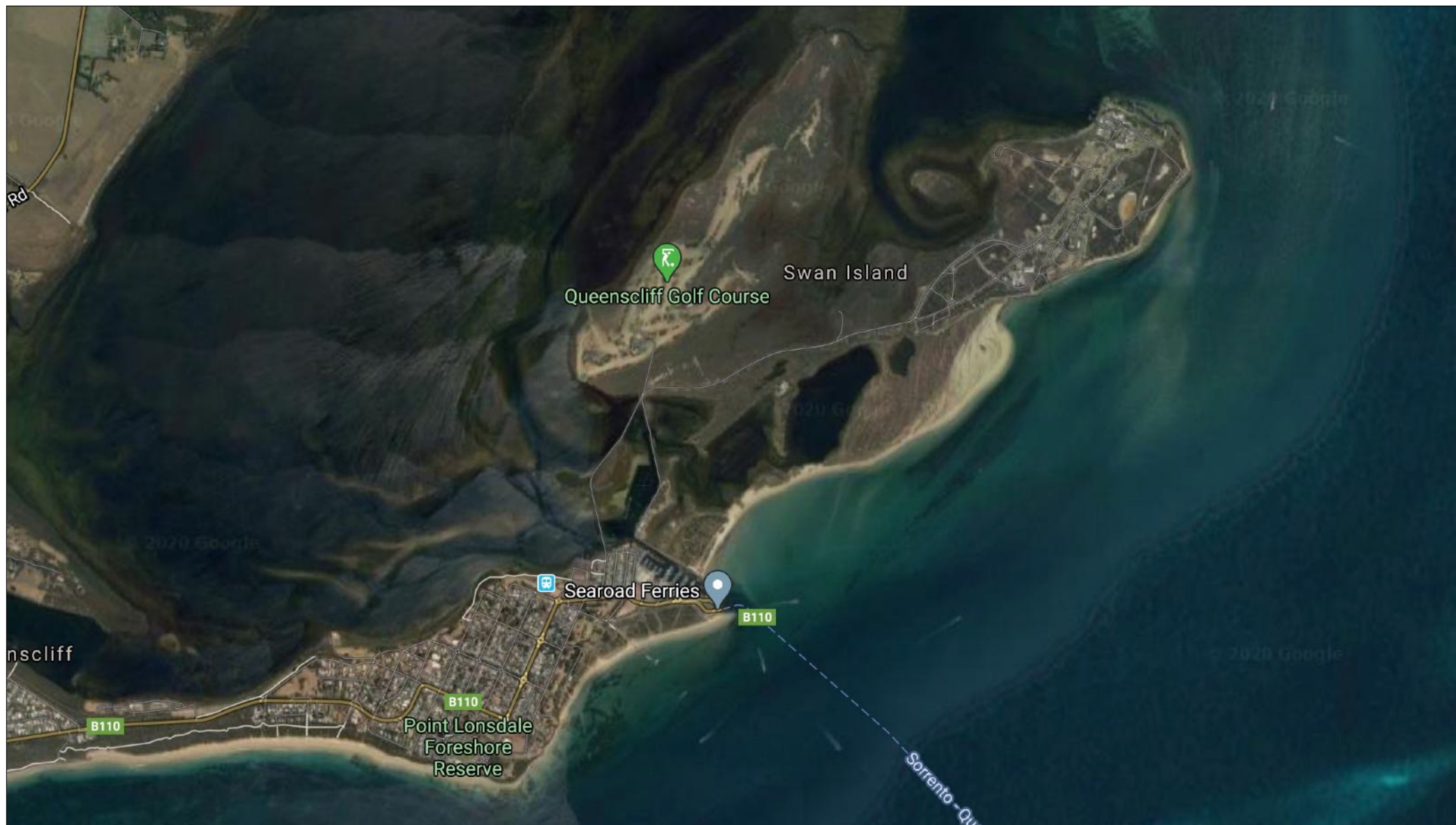
Free forum tickets and more information at www.pecan.org.au

"You're the freak that scares the world."

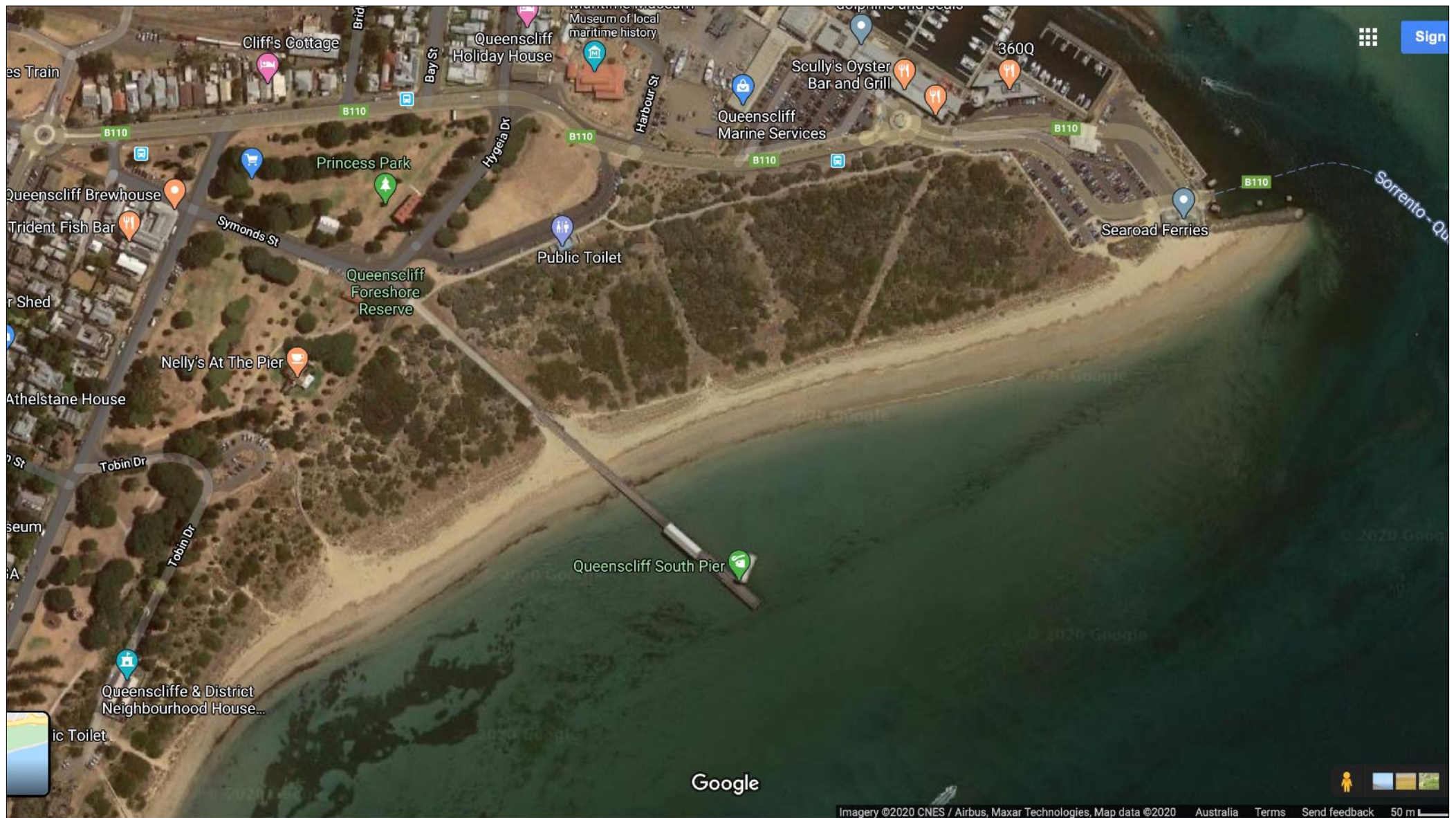
Passer-by: Bourke St, Melbourne
9am, 4th July 2008









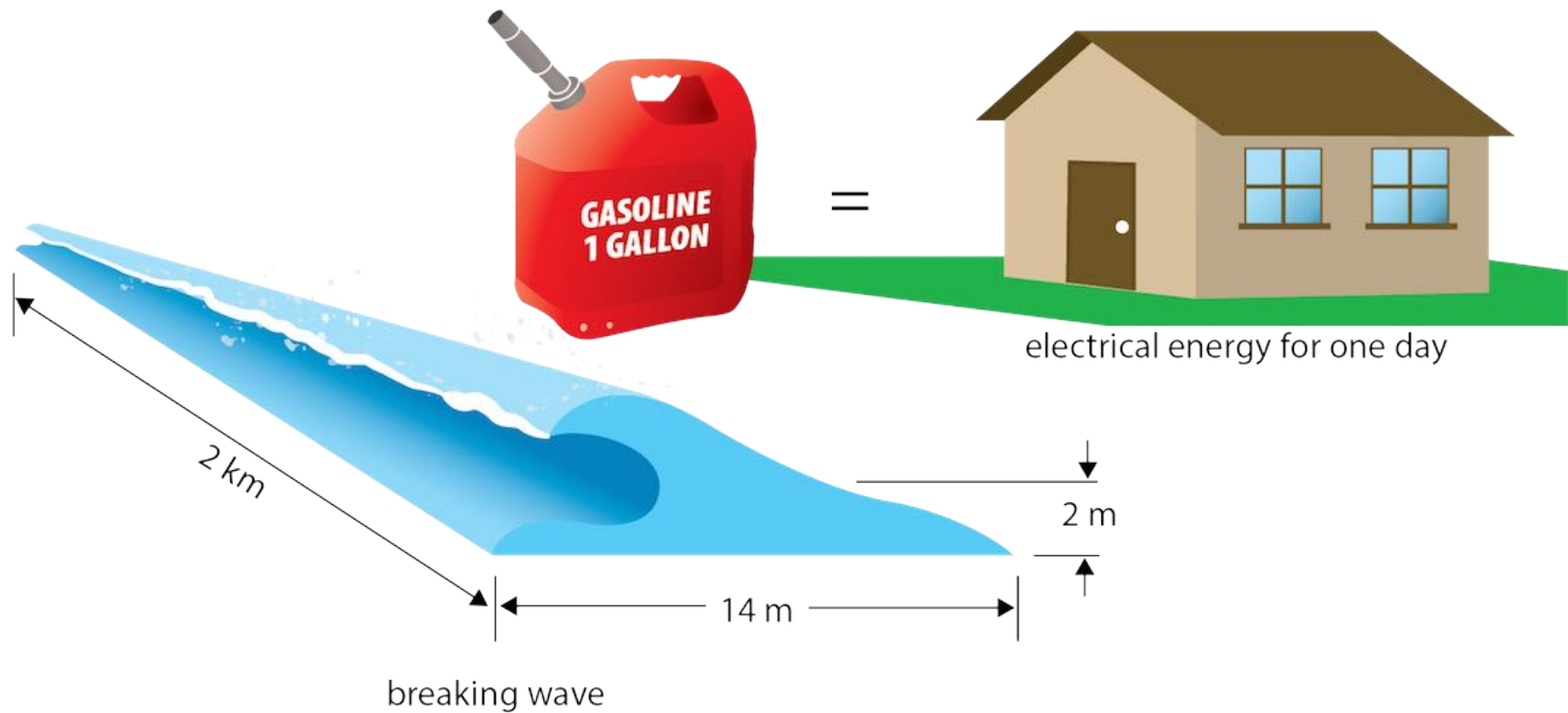


Waves



Waves

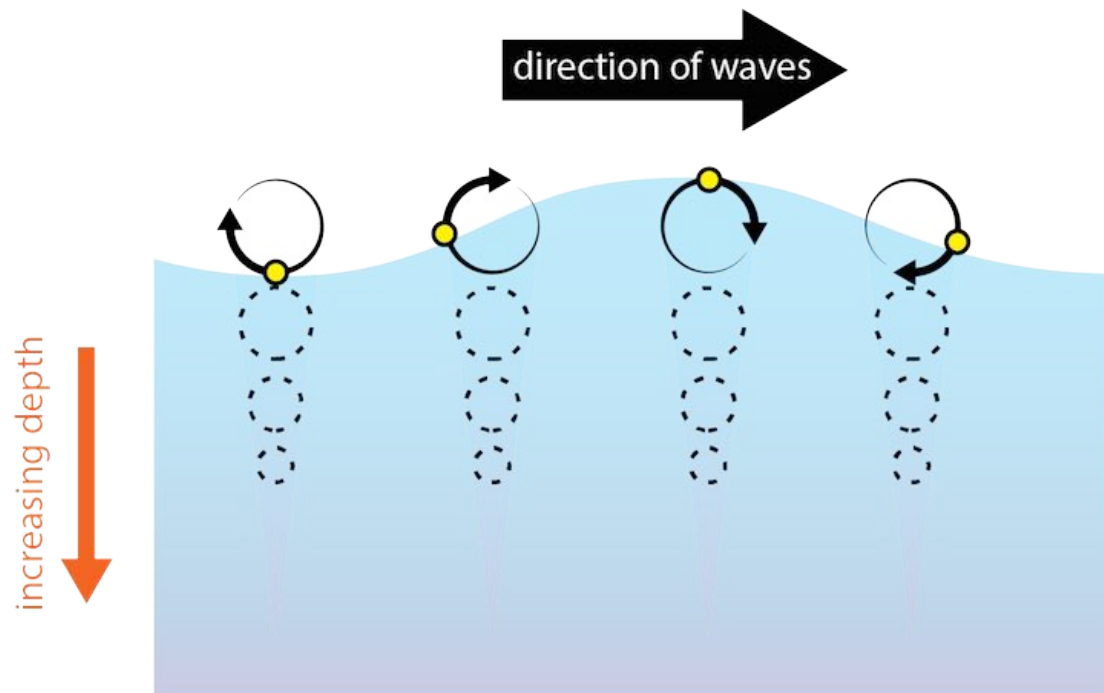
- Ocean waves carry huge amounts of **energy**.
- Wave A is two times the height of wave B, then wave A has **four times the energy** per square meter of water surface as wave B.



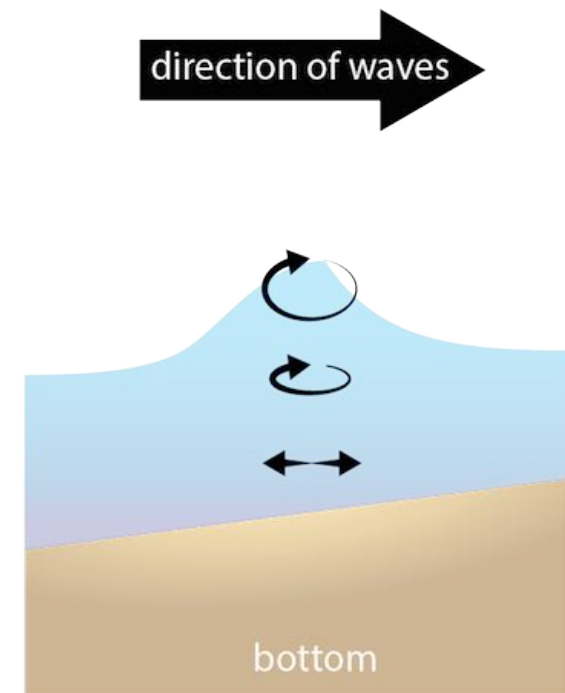
<https://manoa.hawaii.edu/exploringourfluidearth/physical/waves/wave-energy-and-wave-changes-depth>

Image by Byron Inouye

Waves



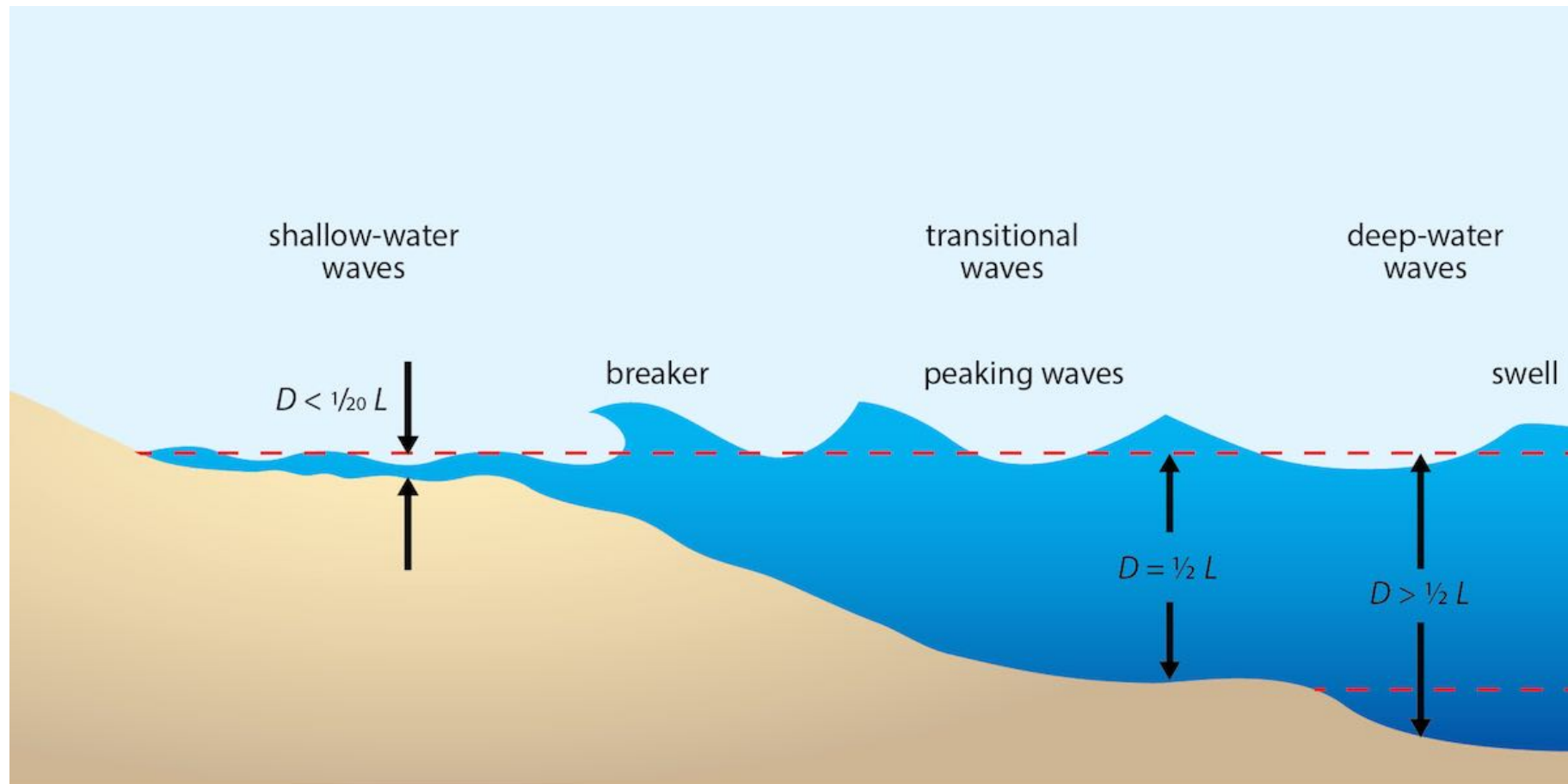
A A wave in deep water



B A wave in shallow water
rotation destruction

Waves

Swell waves



<https://manoa.hawaii.edu/exploringourfluidearth/physical/waves/wave-energy-and-wave-changes-depth>

Image by Byron Inouye









Kerferd Road pier, 3 February 2005

Seaspray Surf Life Saving Club





Yamba SLSC, 2009



Old Bar, NSW, April 2016

The Guardian

'It's heartbreaking': storms cause devastating erosion at Newcastle's Stockton beach

The beach that lost some 20,000 cubic metres of sand to large swells last year has been battered again

Amaani Siddeek

Wed 12 Feb 2020 19:08 AEDT



The 3,600 cubic metres of sand brought in to replenish Stockton beach in December was swept away and even more damage done by this week's storms. Photograph: Darren Pateman/AAP

"Devastating" erosion at Newcastle's Stockton beach has put the future of surfing and surf life saving in jeopardy, as anxious residents await further damaging swells at the end of the week.

The director of education at the Stockton surf life saving club, Willow Forsyth, said 3,600 cubic metres of sand that was injected into targeted areas of the beach in December had been swept away, and even more damage done by this week's storms.

"The council is doing a fantastic job, but 5,500 tonnes of sand and more was lost to the storm," she said. "It's devastating."

Forsyth said the beach deserved as much consideration as Newcastle's port, and losing it was "totally inequitable". All programs at the life saving club have been halted, but Forsyth said the effect was worst on its junior program.

"It's a critical time in their life where they're learning to face challenges.

"The disruption to the program breaks down their whole social network - they don't see



Stockton beach, Newcastle, February 2020

ENVIRONMENT WEATHER EXTREME WEATHER

The Sydney Morning Herald

The early warning system being developed to shore up Australia's beaches

By **Peter Hannam** and **Madeleine Bower**

February 15, 2020 — 12.00am

f t e A A A

Coastal erosion at North Narrabeen in northern Sydney. The photos, taken as part of the CoastSnap project, show the beach on January 30 (left), and February 12 (right).

Photos: UNSW Water Research Laboratory

As monstrous surf pummelled Sydney's northern beaches and howling rain storms battered the city last weekend, Ian Turner and his hardy University of NSW research team were in their element.

Six scientists sheltered from the tempest in the Collaroy Services Beach Club, getting what one colleague called a "prime viewing" spot as waves gouged some 25 metres into the sand, leaving sharp vertical drops called scarps.



Coastal erosion at North Narrabeen in northern Sydney. The photos, taken as part of the CoastSnap project, show the beach on January 30 (left), and February 12 (right).

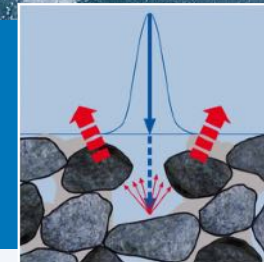
Photos: UNSW Water Research Laboratory

"It was unbelievable," Turner, director of UNSW's Water Research Laboratory, recalled this week as he prepared for another weekend of wrath against the coastline, this time unleashed by ex-tropical cyclone Uesi.

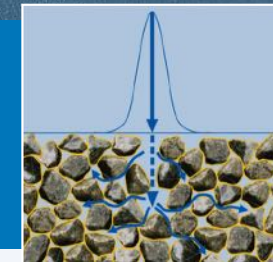
PU Solutions
Elastogran

All you need to know about modern coastal protection.

Stressing of a conventional revetment made of concrete



Revetments using Elastocoast® efficiently absorb wave energy



Elastocoast®.
Making our coasts safer.

BASF
The Chemical Company

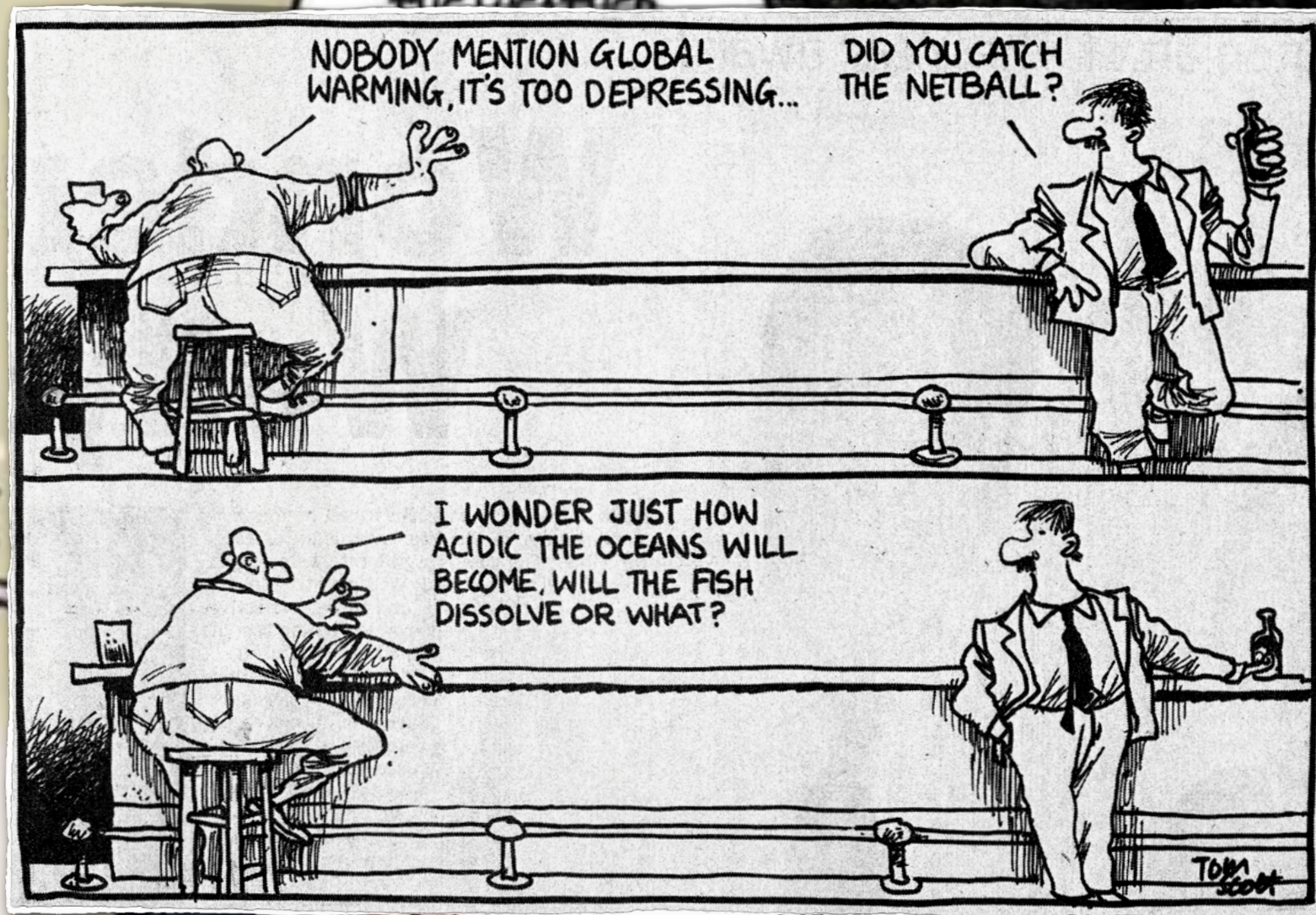






Great Ocean Road, Apollo Bay, July 2006






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MATT SIMON SCIENCE 02.24.2020 11:00 AM

Australia's Bushfires Completely Blasted Through the Models

The wildfires weren't just unprecedented—scientists didn't think such catastrophic conflagrations would happen until the end of this century.



PHOTOGRAPH: BROOK MITCHELL/GETTY IMAGES

Notability 6:16 am Fri 28 Feb abc.net.au

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Science


Climate change has pushed the world's oceans to record temperatures

TOP SCIENCE STORIES



Thermal expansion of surface water = sea level rise (SLR)

First posted: 14 January 2020 at 12:24 pm



The rate of warming has increased by 450 per cent, the researchers found. (Instagram: @ricknelsonphotographyfilm)

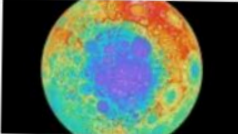
The world's oceans were warmer in 2019 than at any time in recorded history, a new analysis confirms.

The past five years all set records for the highest average annual ocean temperatures, with last year continuing the trend


Key points:

- The Earth's oceans absorbed

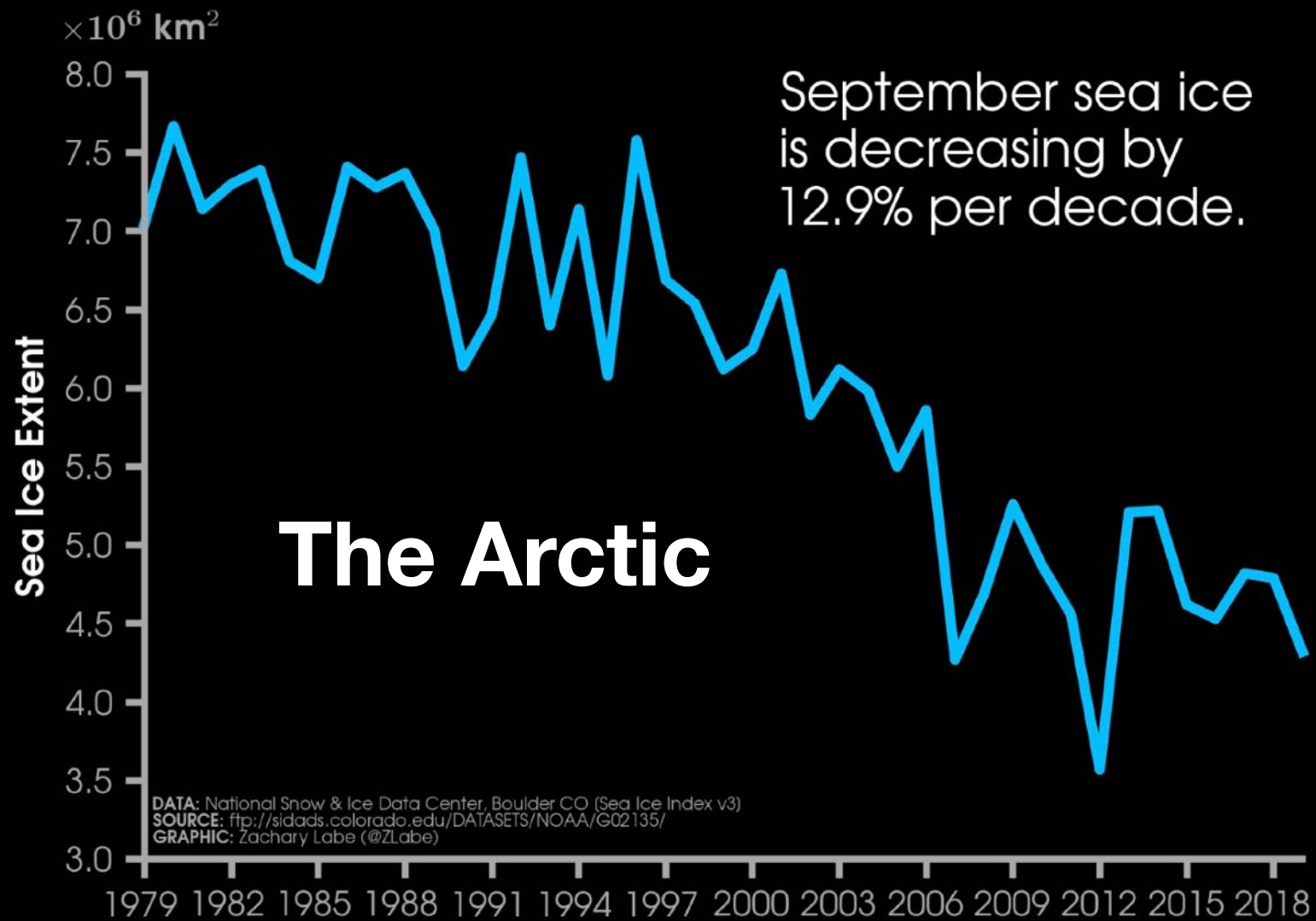
The arch of your foot that helps you walk and run



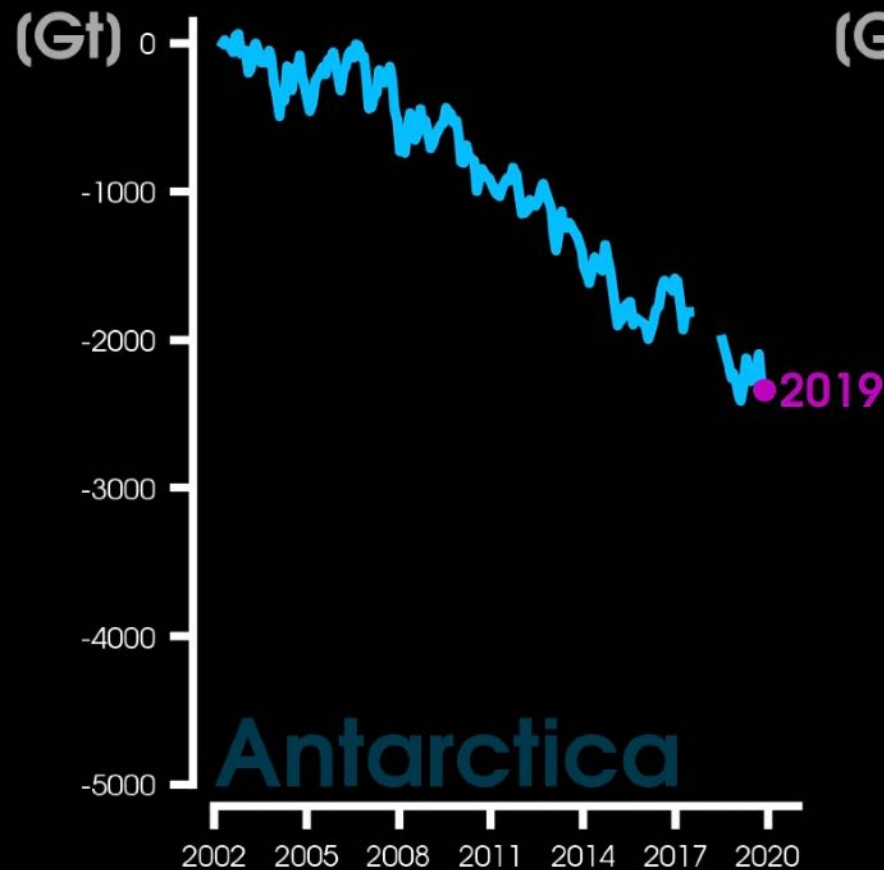
A 12-metre layer of dust and lots of 'impact gardening': The first insights from China's moon mission



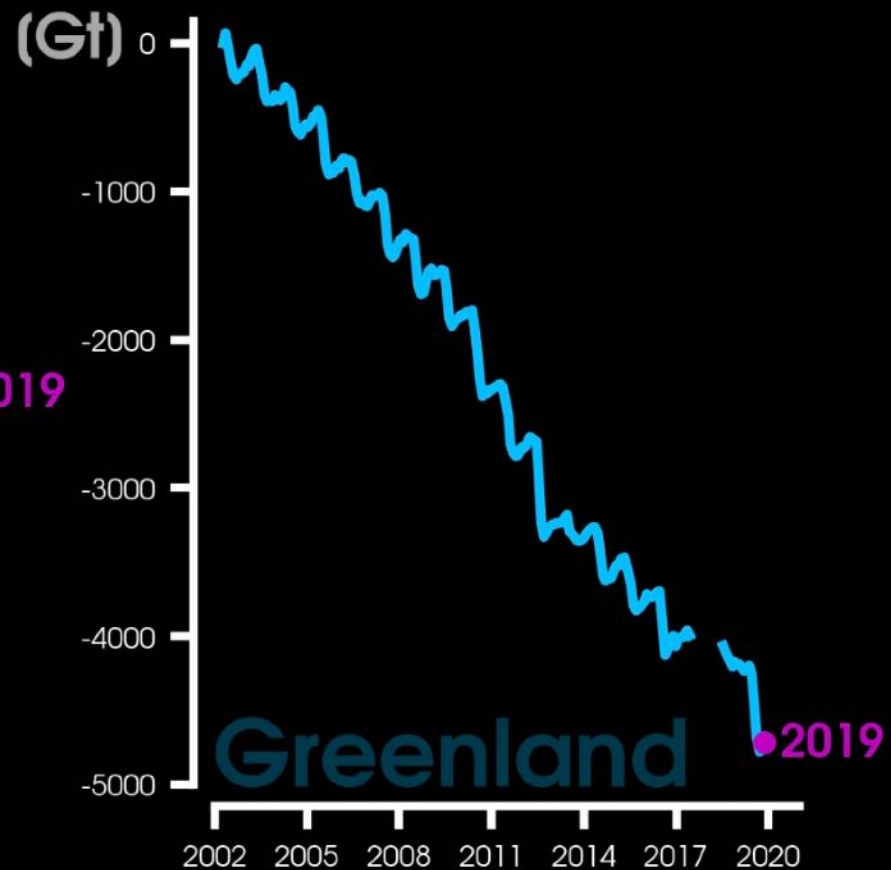
Study dates Victorian volcano that buried a human-made axe



LAND ICE



DATA: Gravity Recovery and Climate Experiment (GRACE/GRACE-FO)
SOURCE: <https://climate.nasa.gov/vital-signs/land-ice/> (NASA JPL)
REFERENCE: Wiese et al. (2015, 2019)



GRAPHIC: Zachary Labe (@ZLabe)
<https://sites.uci.edu/zlabe/arctic-sea-ice-figures/>

Sea level rise

- IPCC AR5 (2013): between +0.26m and +0.98m by 2100
 - ▶ did not incorporate ice sheet melting
- Victorian Coastal Strategy (2014): +0.8m by 2100
- US National Oceanic and Atmospheric Association (2017):
 - ▶ 2.7m by 2100
- loss of Antarctic and Greenland ice sheets:
 - ▶ SLR will be in the range of 6–7m (Hansen et 2016)

Estimating the Potential Risks of Sea Level Rise for Public and Private Property Ownership, Occupation and Management

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Abstract: The estimation of future sea level rise (SLR) is a major concern for cities near coastlines and river systems. Despite this, current modelling underestimates the future risks of SLR to property. Direct risks posed to property include inundation, loss of physical property and associated economic and social costs. It is also crucial to consider the risks that emerge from scenarios after SLR. These may produce one-off or periodic events that will inflict physical, economic and social implications, and direct, indirect and consequential losses. Using a case study approach, this paper combines various forms of data to examine the implications of future SLR to further understand the potential risks. The research indicates that the financial implications for local government will be loss of rates associated with total property loss and declines in value. The challenges identified are not specific to this research. Other municipalities worldwide experience similar barriers (i.e., financial implications, coastal planning predicaments, data paucity, knowledge and capacity, and legal and political challenges). This research highlights the need for private and public stakeholders to co-develop and implement strategies to mitigate and adapt property to withstand the future challenges of climate change and SLR.

Keywords: climate change; management; property; property stakeholders; real estate; risk assessment; sea level rise

Data Statement: The research data used in this research are confidential.

Real estate is not an isolated structure; it is integrated into and socially supports communities and individuals.

The potential for losses to property and sea level rise implications.

- **Direct losses:** damage/total loss - inundation; repeat flooding
- **Indirect losses:** operations; loss of rent/revenue/jobs (transport) - periodic or permanent; property value decline
- **Consequential losses:** ‘secondary costs’ from event repercussions - increased depreciation/discount in value
- **Human loss & injury costs:** social cost; loss of life, injuries, aid & emergency issues - floods
- **Losses related to natural capital:** ecosystem damage; heritage loss - depreciation of land and ecosystems, heritage buildings

Dr Georgia Warren-Myers
Senior Lecturer in Property Faculty of Architecture, Building and Planning
Melbourne School of Design, University of Melbourne



Article

Estimating the Potential Risks of Sea Level Rise for Public and Private Property Ownership, Occupation and Management

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1900-2016: sea level rose by 16-21cm
 1990s: 2.5 millimetres per year
 Today: 3.4 millimetres per year.

SLR (m)	SLR No. of Properties Affected	SLR and Flood Levels (+1.6 m)	SLRF: No. Affected	SLRF + Highest Astronomical Tide (HAT) (+0.5 m)	SLRF + HAT: No. Affected	Plus Storm Surge (+0.5 m)	Plus Storm Surge: No. Affected
0.2	0.21%	1.8	3.4%	2.3	12%	2.8	27%
0.5	0.23%	2.1	6%	2.6	18%	3.1	33%
0.8	0.24%	2.4	12%	2.9	27%	3.4	40%
1	0.27%	2.6	22%	3.1	35%	3.6	44%
1.1	0.35%	2.7	28%	3.2	40%	3.7	45%
1.4	1.4%	3	37%	3.5	44%	4	49%
1.6	3.4%	3.2	41%	3.7	47%	4.2	50%
1.8	6%	3.4	44%	3.9	48%	4.4	51%
2	10%	3.6	45%	4.1	50%	4.6	52%
2.4	22%	4	49%	4.5	51%	5	55%
2.7	30%	4.3	50%	4.8	53%	5.3	58%
7	76%	8.6	76%	9.1	78%	9.6	80%



- Study area: risk of SLR of up to 1 metre may not be very large
- Many of the SLR models and projections assume a flat-water scenario that does not consider tides, wind, precipitation and storms.
- The number of affected properties disproportionately increases as elements of high tide, existing flood levels and storm surge are considered.
- Integrated approach involving public and private stakeholders - little consideration/action by private stakeholders to date.
- Value implications are a clear concern - lack of discussion, mitigation and action from the property sector in relation to SLR.
- Escalation of impacts of extreme events will question and test the capacity of local councils and governments to manage economically and legally.

Thank you