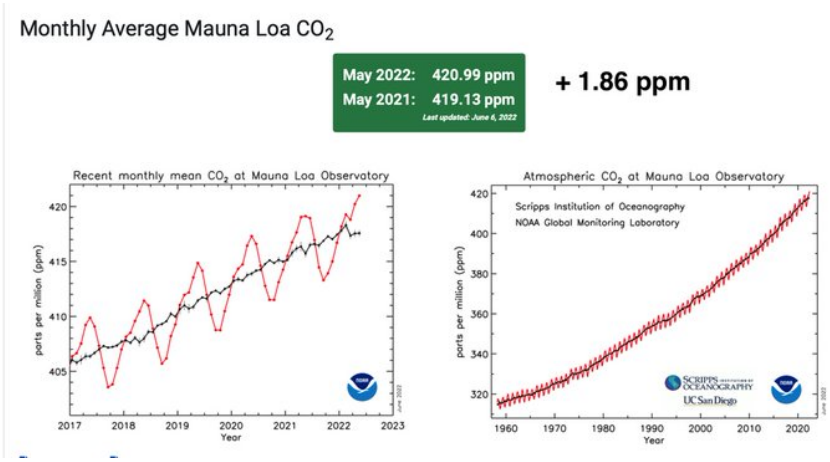
DENDROBIUM MINE EXPANSION OBJECTION

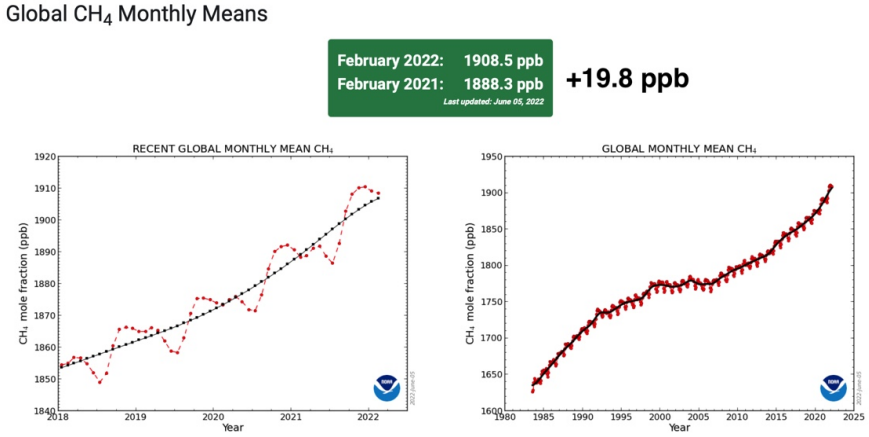
Objection to the Dendrobium coal mine extension has more reasons than most fossil fuel projects to object to in a climate changing world. The total unnecessary application of longwall coal mining in a water catchment adds to further objection and the risks to the catchment have been well documented and it is instructive that the Dendrobium mine extension has already been blocked by the IPC when it was previously submitted.

Since the December 2021 change of the proposal to State Significant Infrastructure there have been many climate disasters some of which have occurred in Australia like the record floods in northern NSW, record floods, fires, and temperatures at many places around the world, and that are mounting in the number of people and ecosystems affected, and the financial costs incurred. The causes of climate change are due to greenhouse gases such as CO_2 and CH_4 (methane) which the Dendrobium mine extension will contribute to and will affect Australia's emissions targets and also those of the NSW 2050 Net Zero plan.
https://www.environment.nsw.gov.au/topics/climate-change/policy-framework

Two of the main greenhouse gases contributed by humans digging up fossil fuels are now at record levels never before seen by humans:

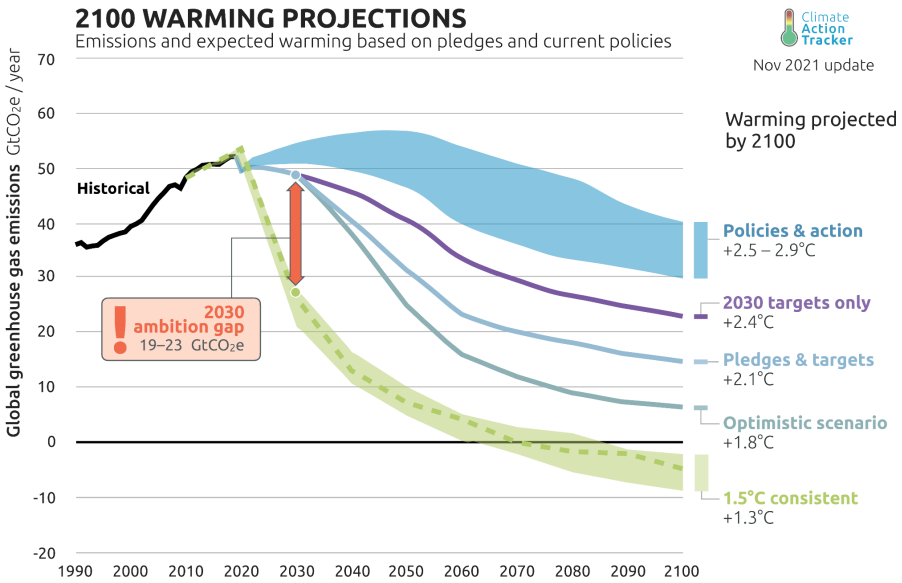


(https://gml.noaa.gov/ccgg/trends/mlo.html)

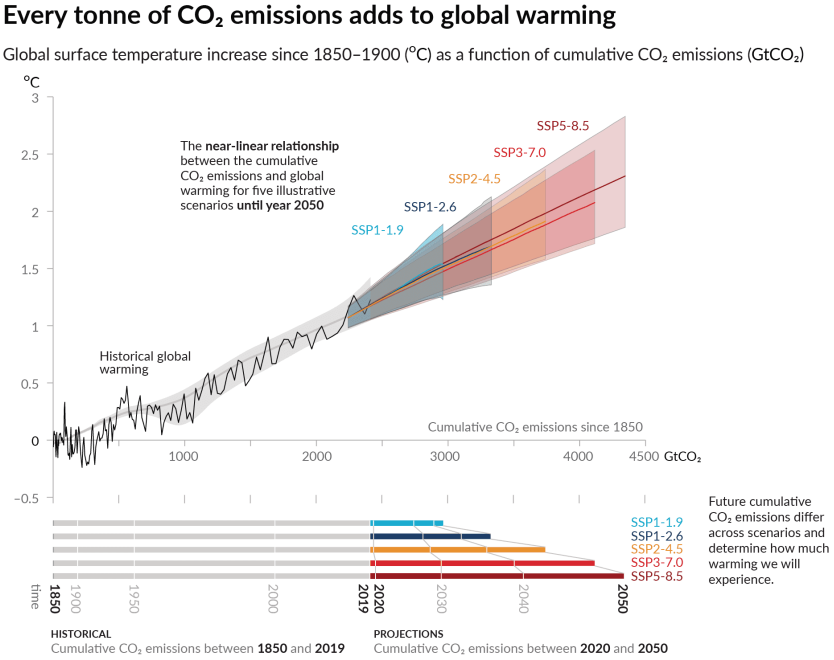


https://gml.noaa.gov/ccgg/trends_ch4/

“Without increased government action, the world will still emit twice the greenhouse gas emissions in 2030 than is allowed under the 1.5°C limit of the Paris Agreement. The world is heading to a warming of 2.4°C with 2030 targets and even higher, 2.7°C, with current policies.” https://climateactiontracker.org/publications/despite-glasgow-climate-pact-2030-climate-target-updates-have-stalled/



(https://climateactiontracker.org/publications/despite-glasgow-climate-pact-2030-climate-target-updates-have-stalled/)

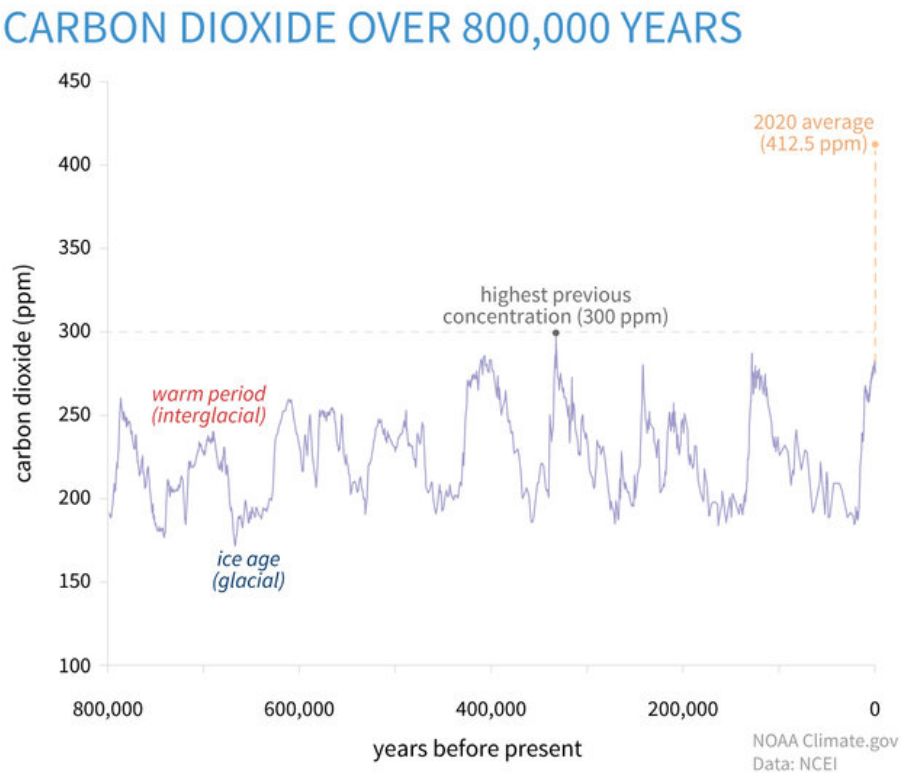


https://www.ipcc.ch/report/ar6/wg1/figures/summary-for-policymakers/figure-spm-10/

As of May, 2022, CO_2 at Mauna Loa has risen beyond 420ppm. The following was published on August 14, 2020:

“Carbon dioxide levels today are higher than at any point in at least the past 800,000 years. In fact, the last time the atmospheric CO_2 amounts were this high was more than 3 million years ago, during the Mid-Pliocene Warm Period, when temperature was 2°–3°C (3.6°–5.4°F) higher than during the pre-industrial era, and sea level was 15–25 meters (50–80 feet) higher than today.”

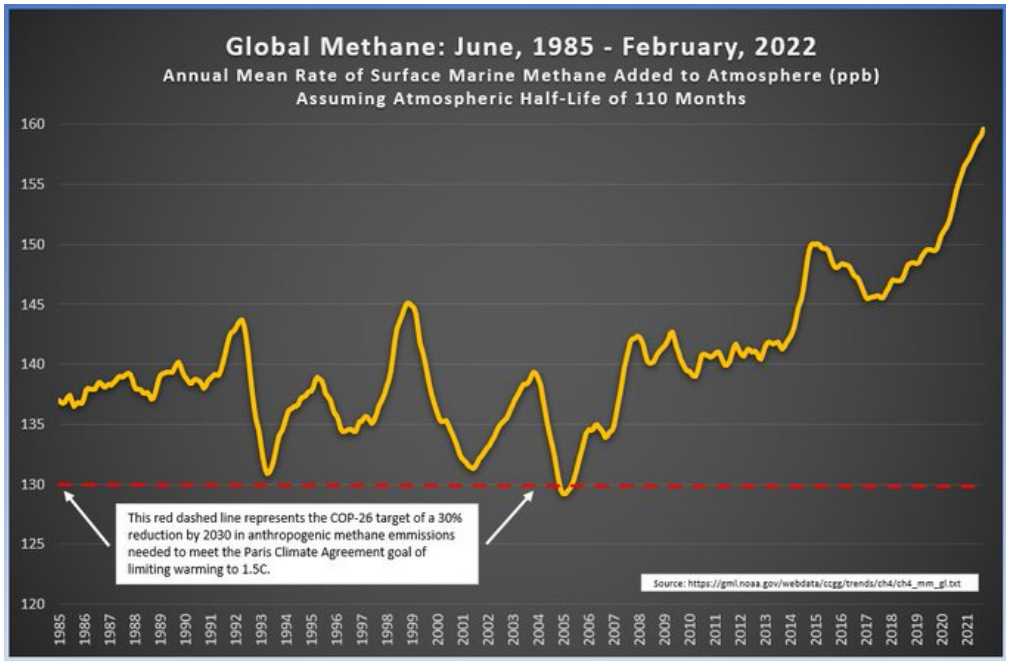
https://www.climate.gov/news-features/understanding-climate/climate-change-atmospheric-carbon-dioxide



https://www.climate.gov/news-features/understanding-climate/climate-change-atmospheric-carbon-dioxide

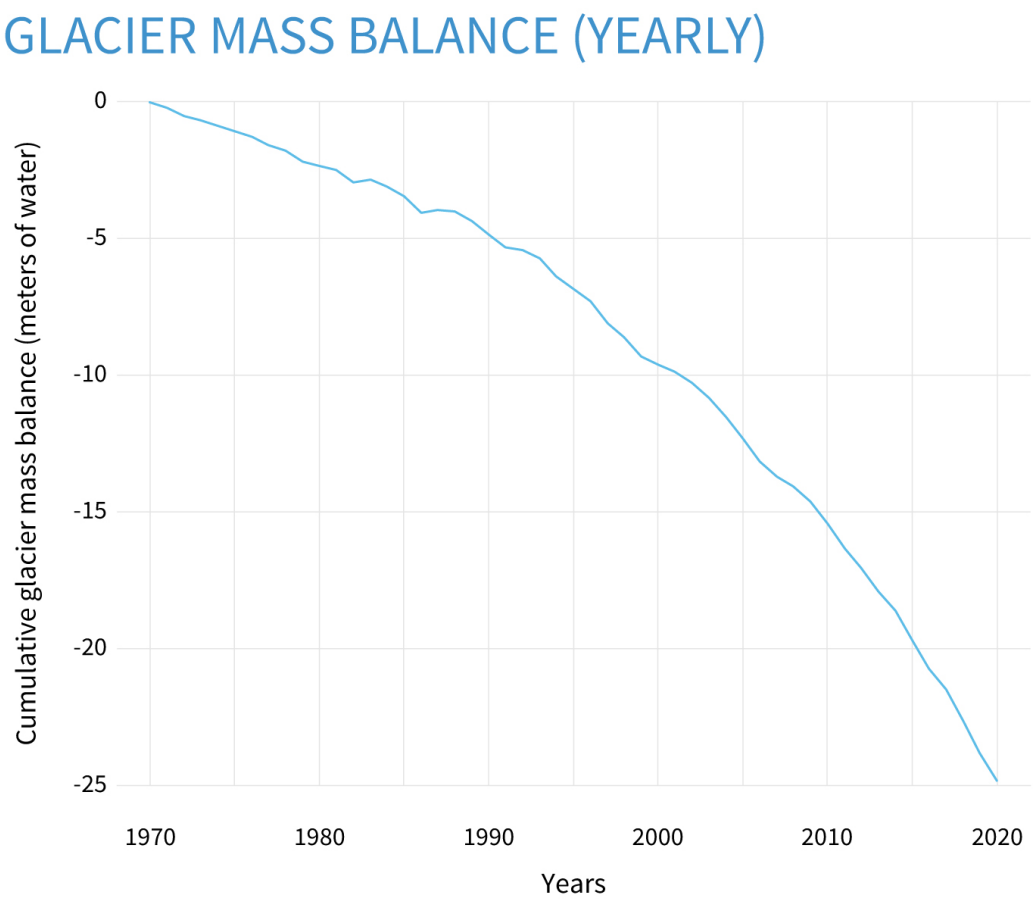
Among the concern of CO_2 emissions, CH_4 emissions are also very troubling, and Dendrobium will add to the growing CH_4 emissions.

“Annualized methane growth hits a new all-time high at 159.6 ppb. In other words, more methane was added to the atmosphere in the last 12 months than in any other 12 month period during which such records have been kept.”



https://twitter.com/EliotJacobson/status/1533895441841917952?s=20&t=yVkUmMKqI4oW3R7zDzbV9g

“Among the most dramatic evidence that Earth's climate is warming is the retreat and disappearance of mountain glaciers around the world. Based on preliminary data for 2019/2020, 2020 was the 33rd year in a row that glaciers tracked by the World Glacier Monitoring Service lost rather than gained ice.”

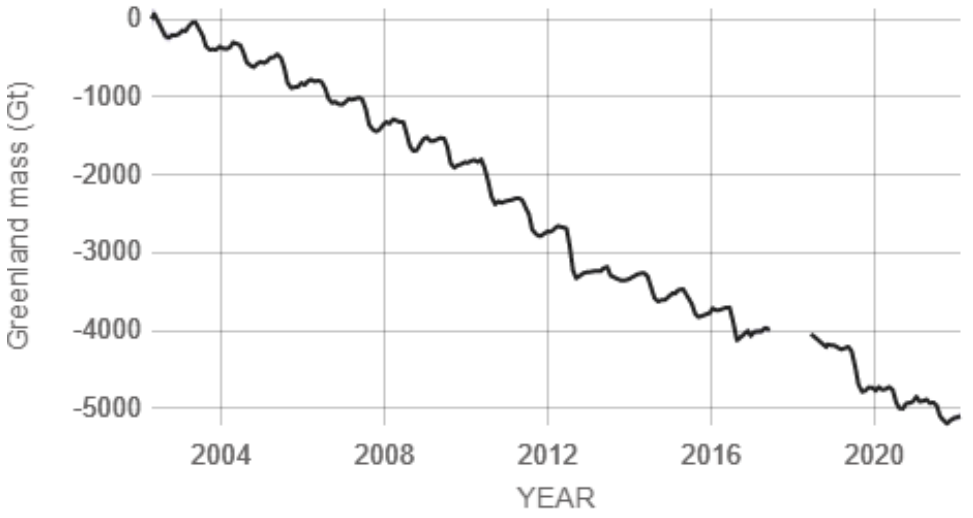


“Ice loss relative to 1970 for the glaciers in the World Glacier Monitoring Service's climate reference network. *Glacier mass balance* is the annual balance between how much snow accumulates on a glacier and how much ice is lost through melting, sublimation, or iceberg calving. Including the preliminary values for 2019-2020, these glaciers have lost a volume of ice equivalent to about 27.5 meters (90 feet) of water spread out over each glacier. NOAA Climate.gov image, based on data from the WGMS.”

https://www.climate.gov/news-features/understanding-climate/climate-change-glacier-mass-balance

Antarctic and Greenland ice mass loss:

Source: climate.nasa.gov

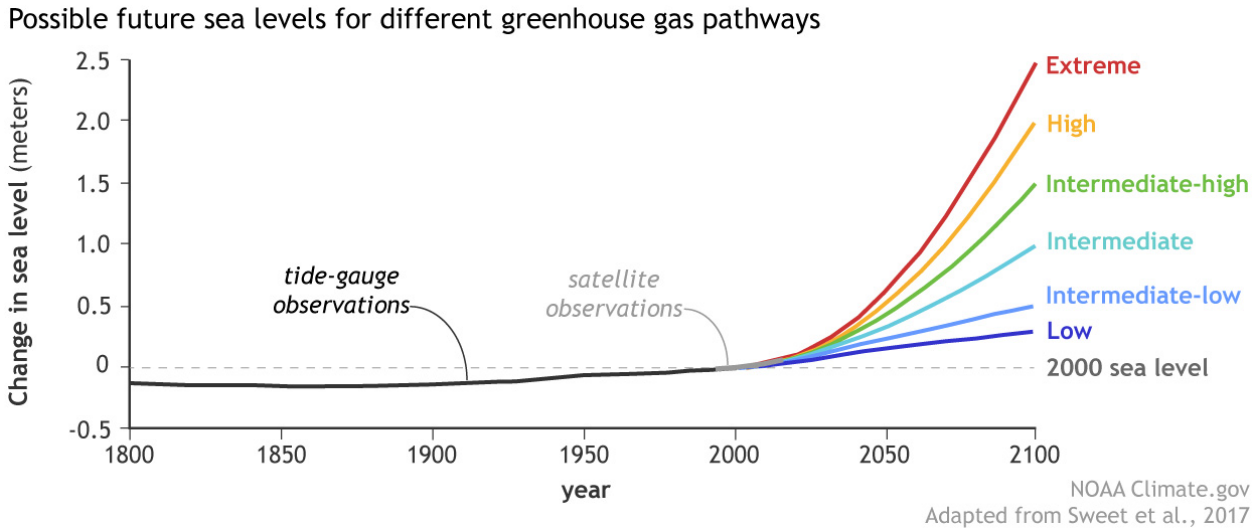


Source: climate.nasa.gov

https://climate.nasa.gov/vital-signs/ice-sheets/

While sea level rise from melting land ice and glaciers may be a slow process, it is one that can continue for centuries and what we do now with emissions and built in warming will affect the level of sea rise future generaitons can expect. Erosion of such places as sandy beaches may be one of the effects of sea level rise, while rocky shorelines may seem relatively unaffected though as sea level rise will still be rising slowly.

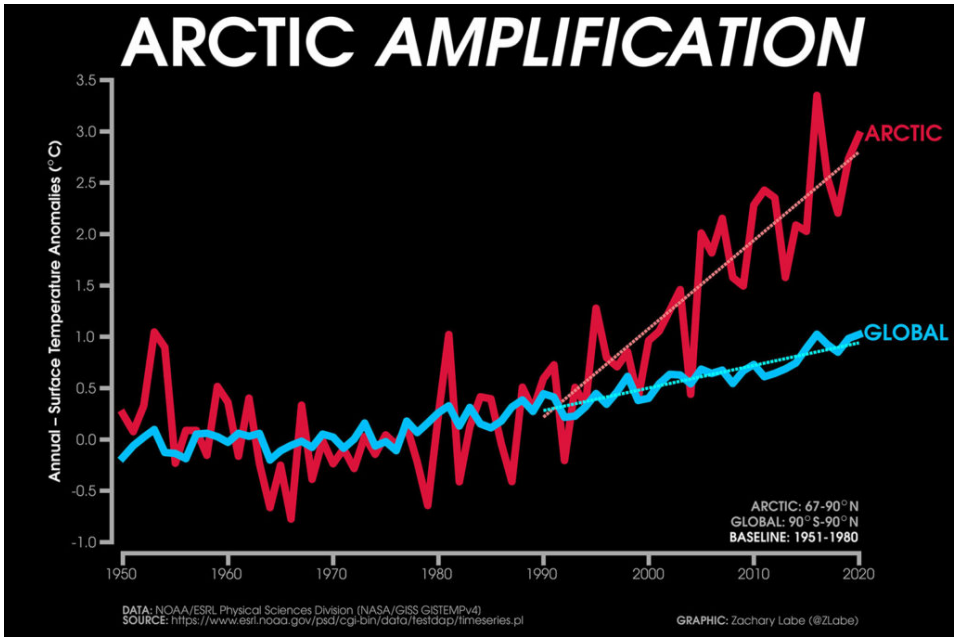
Historical and Projected Global Average Sea Level Rise Under Different Emissions Scenarios



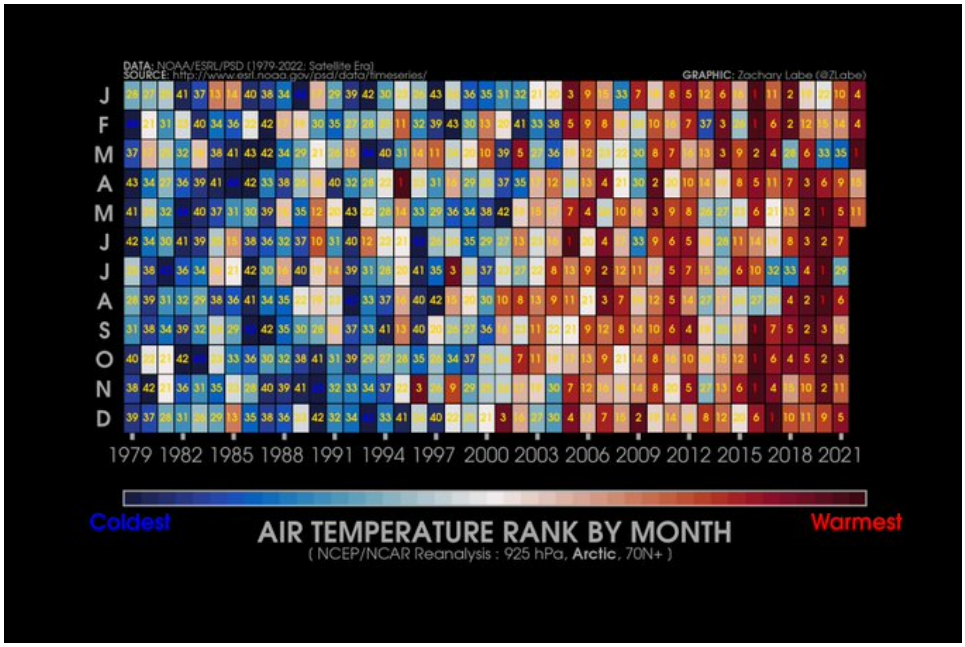
“What’s more, the more the world limits its greenhouse gas emissions, the lower the chance of triggering instabilities in the polar ice sheets that are challenging to model but could substantially increase sea level rise.”

https://drupal-www.climate.woc.noaa.gov/news-features/understanding-climate/climate-change-global-sea-level

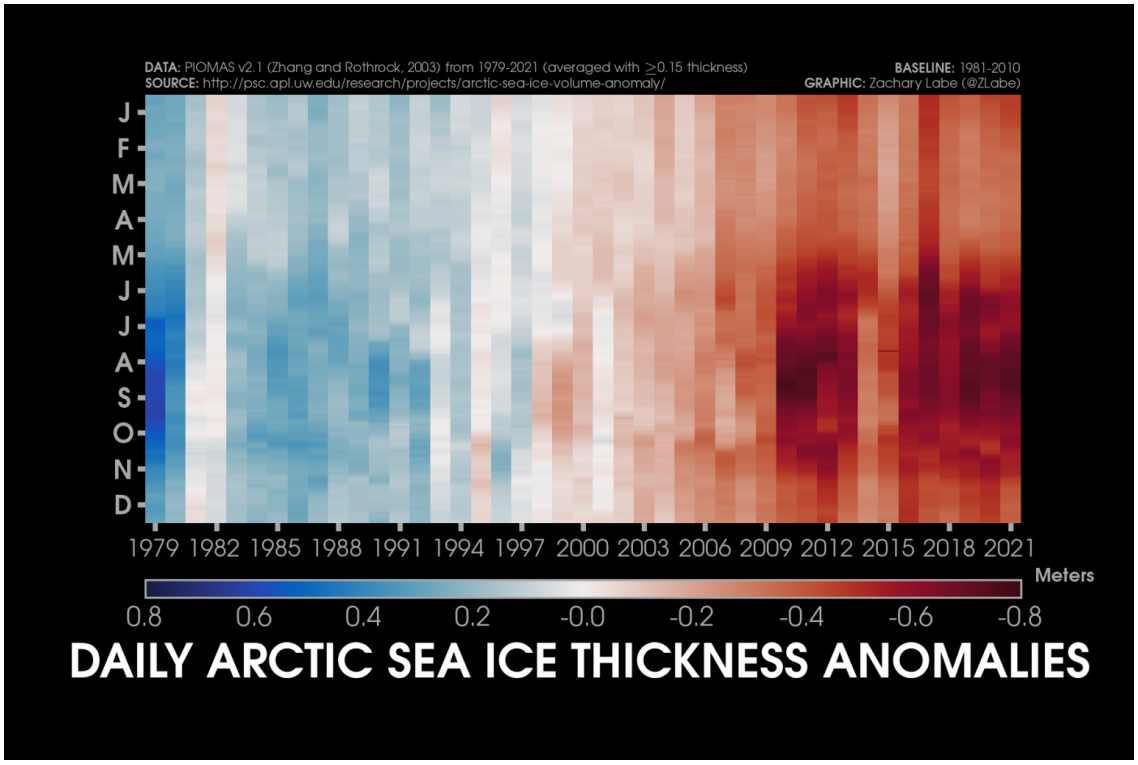
The Arctic has seen much faster warming than the global average, and this may be attributable to diminishing surface-albedo feedback. Surface albedo feedback is when light is reflected by snow and ice. As the Arctic warms and loses ice, the open ocean absorbs more sunlight. Following are graphics from Zachary Labe on the results of the Arctic amplification:



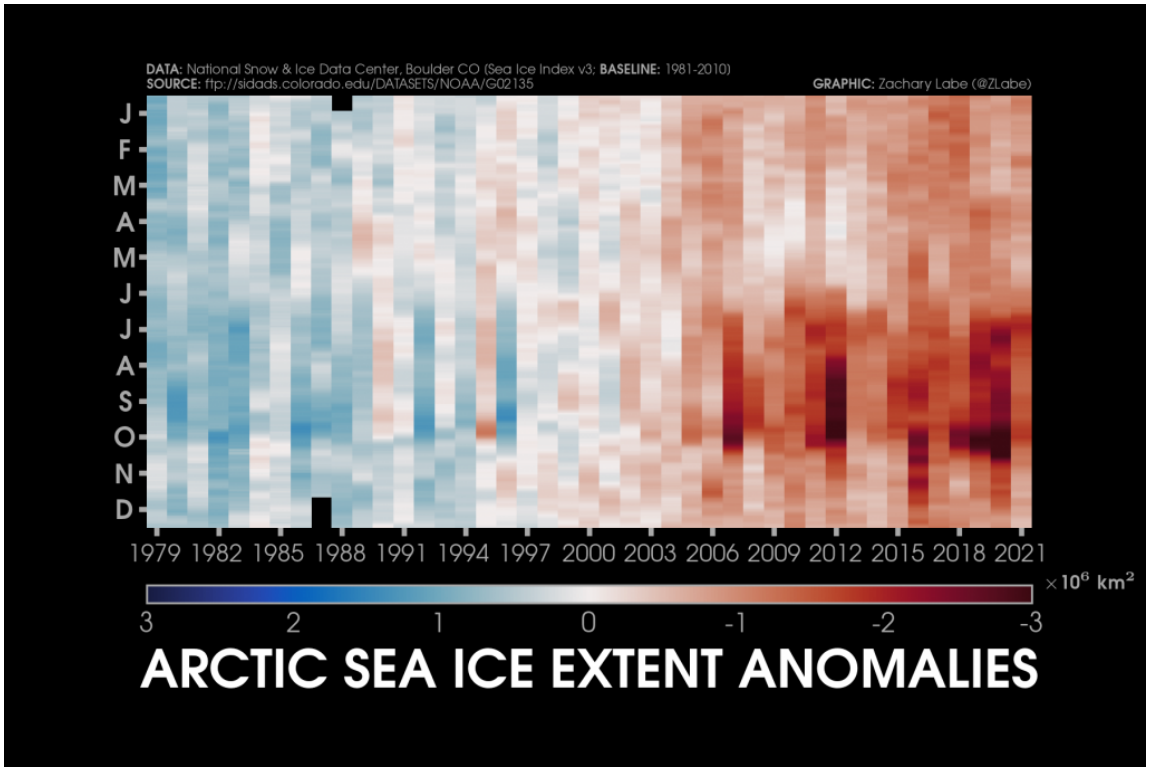
https://sites.uci.edu/zlabe/arctic-temperatures/



https://sites.uci.edu/zlabe/arctic-temperatures/

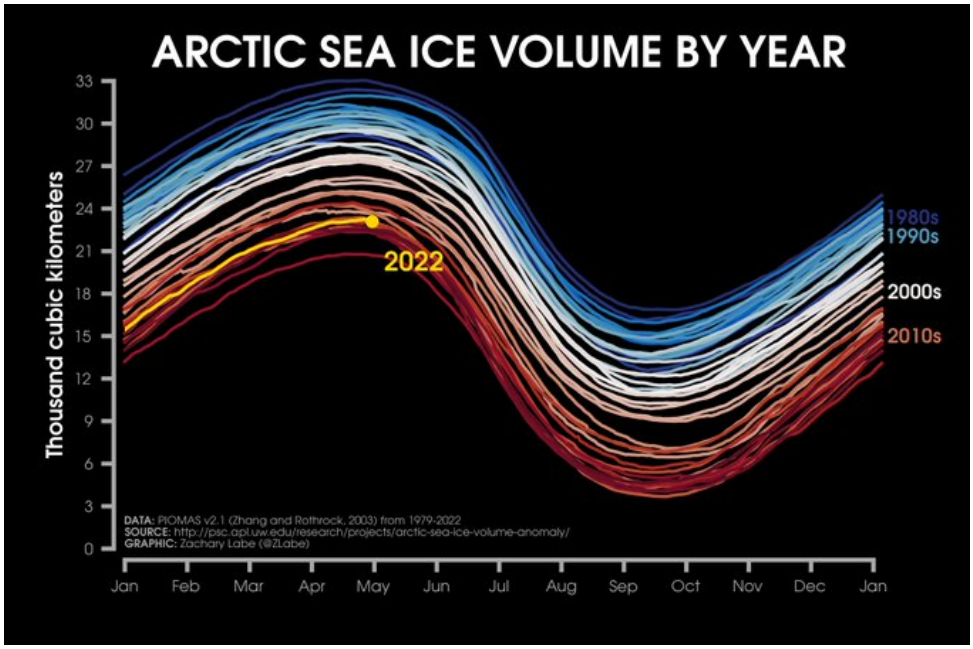


https://sites.uci.edu/zlabe/arctic-sea-ice-volumethickness/



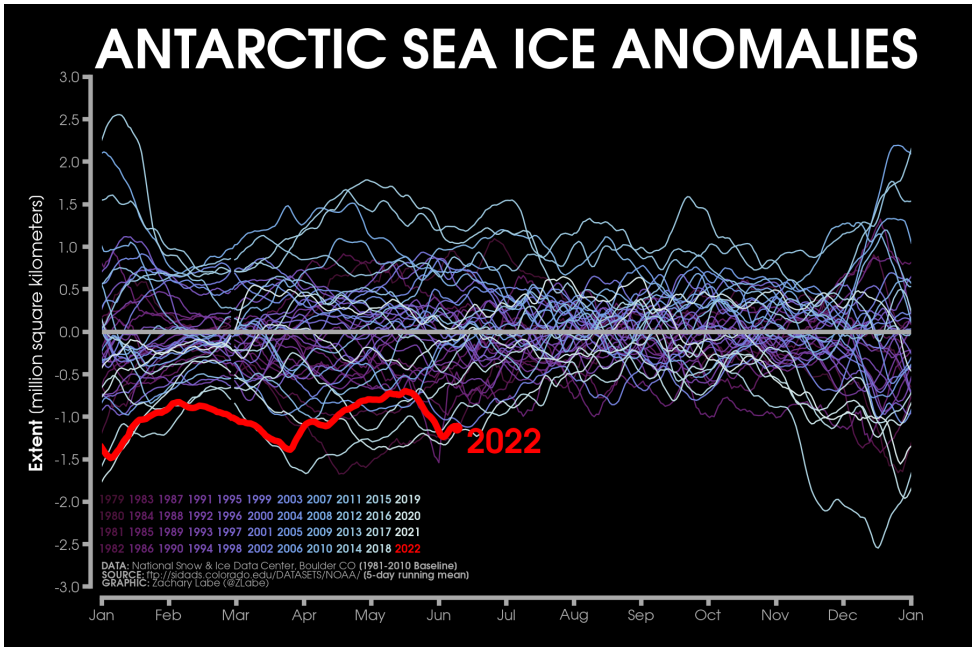
DENDROBIUM MINE EXPANSION OBJECTION
Steven Leuver

https://sites.uci.edu/zlabe/arctic-sea-ice-figures/



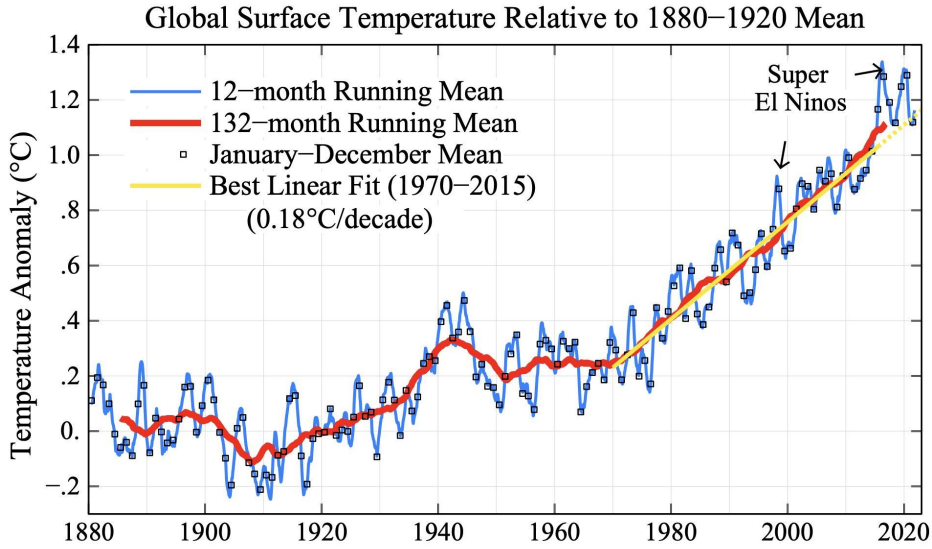
https://sites.uci.edu/zlabe/arctic-sea-ice-volumethickness/

The Antarctic sea ice had not been deteriorating as quickly as the Arctic, but that is showing signs of loss of extent this year. There are many glaciers in the Antarctic as sea ice shelves that connect to the land, that are showing signs of deterioration too. That may contribute to catastrophic ice loss if those shelves break apart.

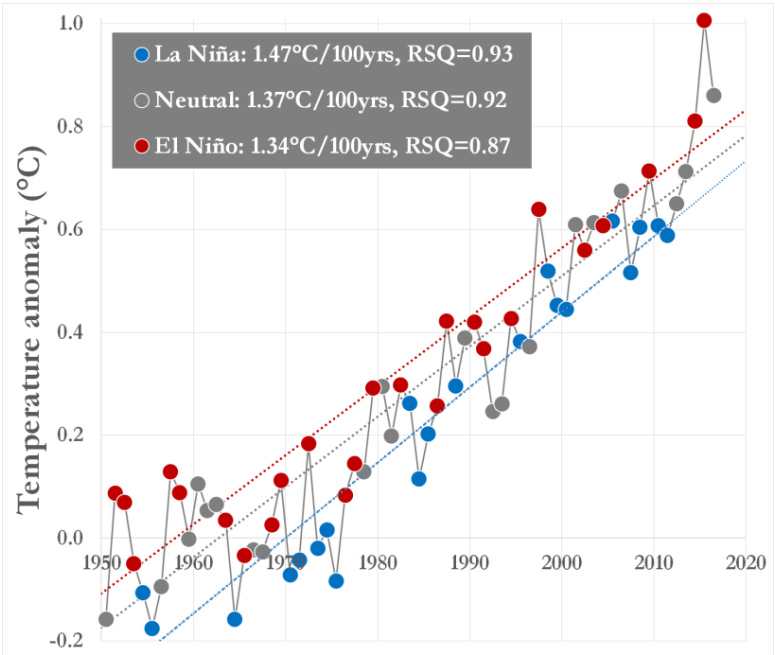


https://sites.uci.edu/zlabe/antarctic-sea-ice-extentconcentration/

As can be seen in the following two charts La Niñas are now warmer than El Niños of decades earlier. This is very concerning. One effect of this warmer 2022 La Niña has been extensive bleaching of the Great Barrier Reef for the first recorded time during a La Niña year.



http://www.columbia.edu/~mhs119/Temperature/



http://chartedterritory.us/2018/02/03/the-world-is-getting-enso-hot-el-nino-la-nina-and-rising-global-temperature/

Australia's closest neighbour; New Zealand, experiencing it's warmest year in 2021; a La Niña year.

"The National Institute of Water and Atmospheric Research (NIWA) has said that 2021 has set a record-high mean land temperature of 13.56°C, almost one degree higher than the 1981–2010 average.

https://www.insurancebusinessmag.com/nz/news/environmental/2021-breaks-record-for-new-zealands-hottest-year--niwa-321732.aspx#:~:text=The%20National%20Institute%20of%20Water,ago%2C%20the%20NZ%20Herald%20reported.

"This made it New Zealand's hottest year since records began being kept over 100 years ago, the NZ Herald reported. 2021 beat out the previous record-holder, 2016, and surpassed 2018, which had a record-hot summer, and 1998, when the Pacific experienced an extremely severe El Niño season."

Every year since 1977, NIWA has conducted aerial surveys of several glaciers to see how much snow from the year before has remained covering the glaciers. This year, scientists from NIWA, Victoria University of Wellington, and the Department of Conservation took thousands of photographs of more than 50 glaciers at the end of New Zealand's summer. Since the surveys began, global temperatures have risen by around 1.1°C, and NIWA estimates that New Zealand's Southern Alps have lost more than a third of their ice volume. Lorrey told Stuff that he thought as many as 40 percent of the surveyed glaciers would be gone in 10 years."

https://www.weforum.org/agenda/2022/04/new-zealand-glaciers-becoming-more-skeletal-as-climate-crisis-strips-snow-away/

"Great Barrier Reef suffers first mass bleaching under cooling La Niña
Corals have turned white across all four of the reef's main areas, despite the cooling influence of the La Niña climate phenomenon, in the natural wonder's sixth mass bleaching event of modern times"

https://www.newscientist.com/article/2313668-great-barrier-reef-suffers-first-mass-bleaching-under-cooling-la-nina/

"2021 Tied for 6th Warmest Year in Continued Trend, NASA Analysis Shows"

https://www.nasa.gov/press-release/2021-tied-for-6th-warmest-year-in-continued-trend-nasa-analysis-shows

Though, how society responds to the nature and timing of damaging weather and effects due to the climate crisis will affect just what costs are incurred and which are avoided, and the ability of society to continue to function as a financialised economy, there are several studies which model considerable costs for the Australian economy.

“2 November 2020: If climate change goes unchecked, then Australia’s economy will be 6% smaller and have 880,000 fewer jobs by 2070. That’s a $3.4 trillion lost opportunity over the next half a century. But there’s a $680 billion dividend that’s ours for the taking if we do rise to this challenge, along with 250,000 more jobs.”

https://www2.deloitte.com/au/en/pages/media-releases/articles/new-choice-australia-economy-climate.html

And, considerable costs have already been incurred to due to unprecedented fires and floods:

“A NASA analysis of the bushfire smoke and the bio-carbon emitted over the summer showed that it was the equivalent to Australia’s emissions for one year.”

– David Holmes, founder and Director of the Climate Change Communication Research Hub
https://lens.monash.edu/@a-different-lens/2020/04/23/1380085/australian-bushfire-crisis-impact-adl18

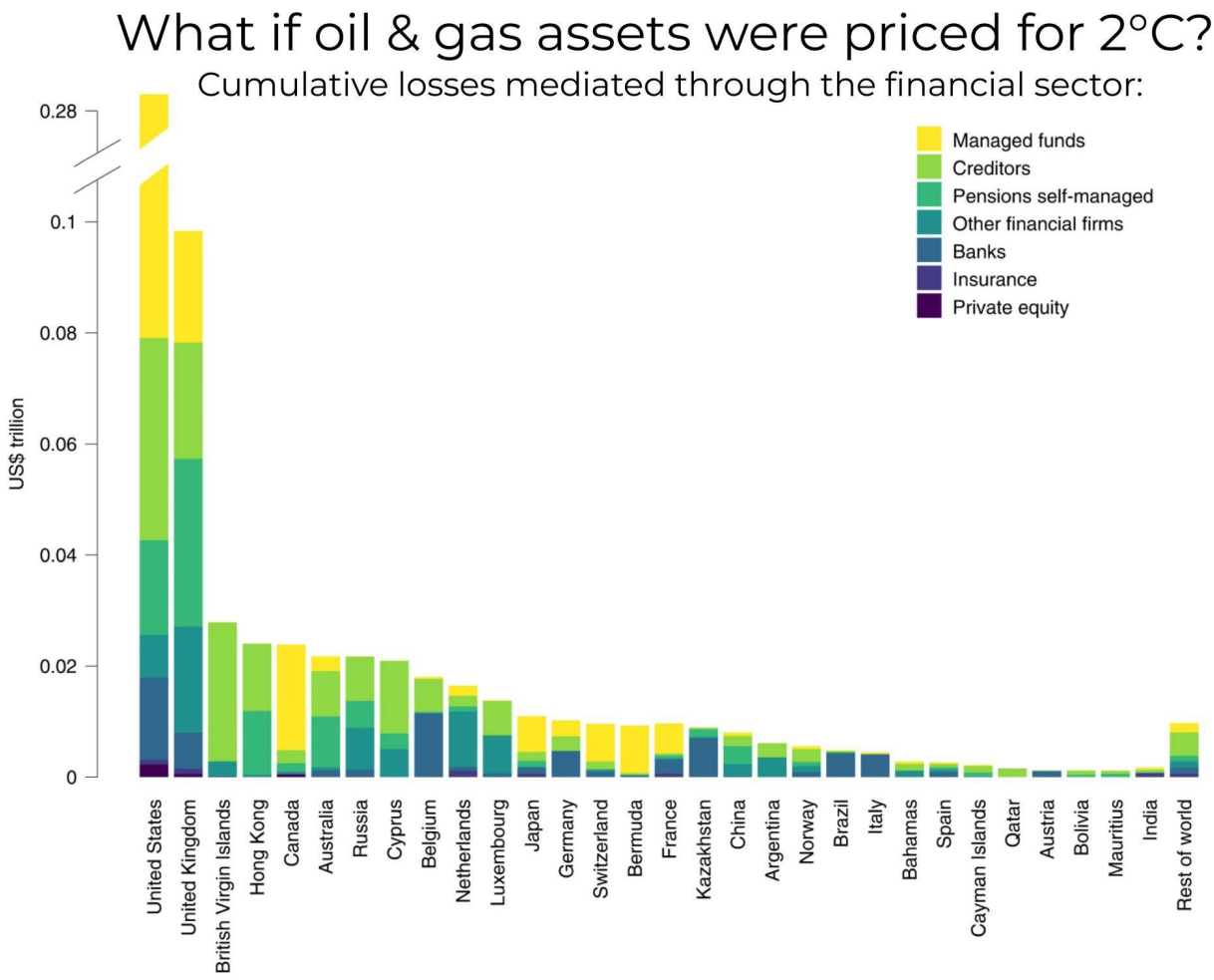
“It already is too late to avoid substantial warming. We are very much on track to exceed the 1.5-degree limit of the Paris Agreement. We’re actually on track for more like three or even higher degrees of warming by the end of the century.”

– Benjamin Henley, climate scientist
https://lens.monash.edu/@a-different-lens/2020/04/23/1380085/australian-bushfire-crisis-impact-adl18

“Insurance Council says cost of northern NSW and south-east Queensland floods now at $4.3 billion
The catastrophic flooding that devastated south-east Queensland and northern NSW is now the fourth most expensive disaster in the nation's history, according to the Insurance Council of Australia (ICA).”

https://www.abc.net.au/news/2022-06-01/flood-costs-for-nsw-and-queensland/101118358?utm_campaign=abc_news_web&utm_content=facebook&utm_medium=content_shared&utm_source=abc_news_web&fbclid=IwAR2Kf9Fb1PV50M6360-2upSYKEKXpSzX0CpSawsDdAkIzl4eItP1V3iij_0

What is the financial cost of opening new mines and approving extensions on the Australian economy if we are going to take any targets seriously? This figure leaves Australia with over $20billion of stranded assets if all nations comply with a calamitous 2°C target. This is not even compliant with the 1.5°C target NSW is aiming for. The flow on effect of this on stock markets and society in general will affect allocation of further resources. Resources that could have been directed at a prosperous future instead of one of crashing and burning. In a time of climate emergency this is development of assets that could have been targeted for renewables and recovery of climate disasters already occurred and made them State Significant Infrastructure.



Source: Semieniuk, G., Holden, P.B., Mercure, JF. et al. Stranded fossil-fuel assets translate to major losses for investors in advanced economies. Nat. Clim. Chang. (2022).

https://www.nature.com/articles/s41558-022-01356-y?fbclid=IwAR1W1jYxUzv0WuFmo9TIkjADT7r2EeVOLxNMXBnpSLTS_5si9nX60hbaLM8

What are the risks of entering a Sixth Great Mass Extinction?

We have been heating the planet at least 1°C in the last 100 years, Australia is above that rate, and that rate is increasing as we have been emitting more in the end of the 20th Century and beginning of the 21st. Feedbacks can cause the planet to warm faster as CH4 and CO2 will be emitted from thawing permafrost, and emissions going underreported as seen with new methods of CH4 detection from mine sites revealing higher than reported levels.

“Major mass extinctions in the Phanerozoic can be linked to thresholds in climate change (warming or cooling) that equate to magnitudes >5.2 °C and rates >10 °C/Myr. The significant relationship between temperature change and extinction still exists when we exclude the five largest mass extinctions of the Phanerozoic. Our findings predict that a temperature increase of 5.2 °C above the pre-industrial level at present rates of increase would likely result in mass extinction comparable to that of the major Phanerozoic events, even without other, non-climatic anthropogenic impacts.”

https://www.nature.com/articles/s41467-021-25019-2?fbclid=IwAR2aIMFRtfViyJjtiuswdaoN1eJ6sp-brVAKAvDLtRI19KRwdO3vXjgeAa0

“Summary:

The sixth mass extinction is underway, this time caused by humans. A team of researchers have calculated that species are dying out so quickly that nature's built-in defense mechanism, evolution, cannot keep up. If current conservation efforts are not improved, so many mammal species will become extinct during the next five decades that nature will need 3-5 million years to recover to current biodiversity levels. And that's a best-case scenario.”

https://www.sciencedaily.com/releases/2018/10/181015154435.htm?fbclid=IwAR0s6Nw79pZKcTfeCYJE-wwYhS3xNqZxMsNY93x8BvFlDUe9Xx1I26s7Chs

It has often been said by proponents of fossil fuel projects that the project might as well go ahead as it will contribute little to the growing cataclysm we face, and it is in this way we are committing an epoch of life on the planet to death by 1,000 cuts as CO_2 iincreases exponentially. Therefore, my objection to the Dendrobium mine extension is that we have to fight for every species and avoidance of every source of climate change we can as we enter the early stage of what is becoming a 6th great mass extinction.