

October 2018



**AUSTRALIAN
CONSERVATION
FOUNDATION**

Out of control climate change in Cook: Hotter, drier and winter no more

Key points

- Climate data modelling by the Science Division of the Queensland Department of Environment and Science (DES)¹ shows that by mid-century communities in the federal electoral division of Cook would be markedly hotter, on average 15 per cent drier and experience more periods of extreme heat because of high global emissions.
- By 2050, the seasonal cycles in Cook would be unrecognisable. Existing average winter conditions would not occur. Spring and Autumn conditions would move towards the middle of the year and contract to four and a half months combined. The rest of the year would be dominated by warmer temperatures associated with summer and joined by an extended and dangerous 'new summer' period.
- This new climate would pose greater threats to human health and critical public infrastructure in the electorate. It would also require plant and animal species in the area to rapidly adapt to a heightened level of climate change, with many unlikely to cope.

Federal electorate climate impact analysis

The Australian Conservation Foundation (ACF) has commissioned design and data experts at the Australian National University (ANU) School of Art and Design to analyse existing climate model projections and apply them to selected federal electorates ahead of the

¹ Queensland Government LongPaddock project, which uses the SILO database (<http://www.longpaddock.qld.gov.au/silo>) and is operated by DES. The climate 'change factors' used to calculate consistent climate scenarios data have been estimated using: Coupled Model Intercomparison Research Program 3 (CMIP3) patterns of change data (projected changes per degree of 21st Century global warming) supplied by the CSIRO and the UK Met Office/Hadley Centre; and data from AR4 SRES scenario temperature response curves (projected amounts of global warming) supplied by the CSIRO. These data sources are available in the following locations:

- The CMIP3 global model database: http://www-pcmdi.llnl.gov/ipcc/about_ipcc.php
- OzClim: <http://www.csiro.au/ozclim>
- UK Met Office/Hadley Centre: <http://www.metoffice.gov.uk/climate-change/resources/hadley>

Data modelling:

- **Perturbation method:** Linear Mixed Effect State Space (LMESS) - Q5
- **Global warming sensitivity:** High
- **IPCC assessment report:** AR5
- **Emission scenario:** RCP8.5
- **Climate model:** ACCESS 1.3

upcoming national election in 2018 or 2019. The same ANU team previously developed the 'climate coasters' series, highlighting already rising temperatures across Australia.²

This project aims to give voters clear information about the dangers climate change presents for their local region if high emissions rates are not cut through concerted global action – including Australia doing its fair share. Voters will be able to use this information to ask all local candidates about their positions on the established climate science, policies for cutting pollution, and plans to help the region they seek to represent adapt to changes already in the climate system.

A hotter and drier Cook

This briefing paper presents preliminary results from this project for the division of Cook. Residents across Rockdale and the Shire in southern Sydney will head to the polls at the next federal election to decide whether they will re-elect Prime Minister Scott Morrison in his local electorate for a fifth time.

Australia is already feeling the effects of climate change. Average surface temperatures have warmed by approximately one degree since 1910.³ The duration, frequency and intensity of extreme heat events has worsened, fire seasons are longer and winter rainfall has declined by 19 per cent since the 1970s.⁴ In Cook specifically, increasing temperatures and extreme heat spikes have already become more apparent. In 2017, the maximum average temperature for Sydney was 1.5 degrees above the long-term average and there were monthly and daily heat spikes that were much higher.⁵ The month of January, for example, was 3.5 degrees above the average, while September was 2.8 degrees above average.⁶ These kinds of extremes are projected to continue with the underlying average temperature increasing over time.

The ANU analysis of climate model projections sourced from the Queensland Government LongPaddock project shows that if greenhouse gas emissions continue at high global rates, voters and their children in Cook would by 2050 expect to experience:

- Average daily maximum temperatures up to 4.3 degrees hotter than Cook's historic average (compared to a 1960-1990 baseline).
- Up to three times more days over 30 degrees (an extra 48 days each year) than the historic average.
- Four additional days a year above 40 degrees.
- Historic winter conditions would disappear, with average winter temperatures rising by up to 3.9 degrees.
- Mid-September through to April would be dominated by existing summer conditions and those of an extreme 'new summer' involving temperatures up to 3.2 degrees hotter than the long-term summer average.
- An average of 15 per cent less rainfall.

² <https://gravitron.com.au/climatecoaster/>

³ <http://www.bom.gov.au/state-of-the-climate/>

⁴ <http://www.bom.gov.au/state-of-the-climate/>

⁵ <https://gravitron.com.au/climatecoaster/>

⁶ <https://gravitron.com.au/climatecoaster/>

Disappearing winter and the new extreme summer

These changes would represent a radical overhaul of Cook's current seasonal patterns and temperatures. When the 1960-1990 long-term average for Cook is compared with the projections for 2050 under a high emissions scenario (see *Figure 1*), winter conditions in the electorate no longer occur. Autumn and Spring would shift to the middle of the year and contract to a combined four-and-a-half months from mid-April to September. The other seven-and-a-half months of the year would consist of current summer conditions and new extreme summer conditions.

Figure 1. Cook's disappearing winter and new extreme summer (1960-1990 average compared to daily projected temperatures for a warm 2050 scenario for two locations in Cook).



Source: ANU School of Art and Design; visualising data from Queensland Government's LongPaddock project.

These warmer conditions would pose significant challenges for human health and infrastructure in Cook. Temperatures over 35 degrees are particularly challenging for human

health as they limit the human body's ability to cool itself.⁷ This can be fatal when the effects are left unattended and the body is not given time to cool down during extended warm periods, such as heatwaves. Heatwaves are Australia's deadliest natural disasters, with over 500 people dying from heatwaves between 2000 and 2009.⁸ The elderly, sick and young are considered most at risk.⁹ The 2016 Australian Census indicates there were over 13,000 people in Cook aged 75 or older, including over 4,500 people older than 85 years.¹⁰ There is also emerging evidence that rising temperatures could cause problems for pregnant women and that higher temperatures could be linked to a greater risk of premature births, stillbirths, or other negative pregnancy outcomes.¹¹ The National Climate Change Adaptation Research Facility has also shown climate change impacts, such as greater extreme heat and coastal erosion, present severe challenges to urban infrastructure critical to areas like Cook, such as public transport, water supply, energy supply and coastal assets.¹²

Cook candidates' position on climate change

This climate future for Cook is not inevitable. It can be avoided through rapid cuts to climate pollution and ultimately bringing net global emissions to zero. The climate change choices we make now will have real world implications for our communities tomorrow.

Australia, like all countries, must do its fair share to stop greenhouse gas emissions from activities like burning coal, razing forests and the use of petrol-fuelled vehicles. Climate Change Authority analysis, factoring in Australia's wealth, population and industry mix, has found the country should cut its emissions by 45 to 65 per cent below 2005 levels by 2030 if it is to do its fair part of the global effort to keep global warming below two degrees, and must cut emissions even further under a 1.5 degree limit to help prevent the worst impacts of climate change.¹³ Australia's current target – set by the Abbott Government – is a reduction of 26 to 28 per cent below 2005 levels by 2030.¹⁴

Australia's absolute emissions are currently rising, up 1.3 per cent in the year-to-March 2018,¹⁵ and have been on an upward trend since the Federal Government repealed the national carbon price in June 2014.¹⁶ Recent emissions projections indicate a significant shortfall in meeting even the government's current inadequate target for 2030.¹⁷

As of late-October 2018 there was little public information about many of the candidates or potential candidates for Cook (besides the Prime Minister) and their positions on the established science of climate change and what should be done in response. This briefing

⁷ <https://academic.oup.com/heapro/article/30/2/239/561863>

⁸ <http://www.abc.net.au/news/2018-01-18/heatwaves-australias-deadliest-hazard-why-you-need-plan/9338918>

⁹ https://www.dea.org.au/wp-content/uploads/2017/02/DEA_Heatwaves_Health_Fact_Sheet_06.pdf

¹⁰ http://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/CED109

¹¹ <https://www.theatlantic.com/health/archive/2017/11/pregnancy-heat-outcomes/546362/>

¹² https://www.nccarf.edu.au/sites/default/files/attached_files_publications/INFRASTRUCTURE_A4-Webview.pdf

¹³ <http://climatechangeauthority.gov.au/sites/prod.climatechangeauthority.gov.au/files/Final-report-Australias-future-emissions-reduction-targets.pdf>

¹⁴ <https://www.environment.gov.au/system/files/resources/c42c11a8-4df7-4d4f-bf92-4f14735c9baa/files/factsheet-australias-2030-climate-change-target.pdf>

¹⁵ <http://www.environment.gov.au/climate-change/climate-science-data/greenhouse-gas-measurement/publications/quarterly-update-australias-national-greenhouse-gas-inventory-march-2018>

¹⁶ https://d3n8a8pro7vhnmx.cloudfront.net/auscon/pages/6614/attachments/original/1538361044/201803_Background_Brief_-_Quarterly_emissions_result_-_March_2018.pdf?1538361044

¹⁷ <https://climateworks.com.au/sites/default/files/documents/publications/climateworksaustralia-tracking-progress-report-2018.pdf>

does not have space to consider all potential candidates' positions, but focuses on the top three polling parties from the 2016 election:

- **Liberal MP for Cook and Prime Minister, Scott Morrison**, in February 2017 brought a lump of coal into the House of Representatives and said: "Don't be afraid, don't be scared, it won't hurt you. It's coal... Those opposite have an ideological, pathological fear of coal." About the recent Special Report on 1.5 degrees of global warming by the Intergovernmental Panel on Climate Change, Mr Morrison said it did not "provide recommendations to Australia." When questioned about government climate targets, the Prime Minister claimed Australia would meet its Paris climate pledges "in a canter", even though government projections show the country will fall well short.¹⁸ The Coalition has recently: dumped the pollution reduction element of the National Energy Guarantee (NEG);¹⁹ stated it will not pursue emissions cuts in energy policy;²⁰ explored options to prolong the life of coal-fired power plants;²¹ and emphasised greater use of the Abbott Government-era Emissions Reduction Fund to pay industry and farmers for pollution cuts.²² Mr Morrison has recognised the importance of climate change to Pacific island nations and rejected calls from within the Coalition for Australia to withdraw from the Paris Agreement.²³
- **Labor candidate, Simon O'Brien**, has not yet said anything explicit about climate change in his candidate statements²⁴ or interviews with local media.²⁵ He has retweeted a post by the Labor Environment Action Network pointing to the dangers of climate change-driven sea-level rise in Cook.²⁶ More broadly, the ALP has committed to a target of 45 per cent emissions reduction from 2005 levels by 2030, and a 50 per cent clean energy target for 2030. It is yet to detail the exact national policies it would implement to deliver these goals,²⁷ although has flagged that it would likely implement the proposed NEG for electricity.²⁸
- **It is unclear as of October 2018 whether the Greens have preselected a candidate for Cook.**²⁹ The Greens' national policy is for net zero or net negative Australia greenhouse gas emissions by 2040 and 100 per cent renewable energy "as soon as possible."³⁰

¹⁸ <https://www.thesaturdaypaper.com.au/news/environment/2018/10/06/fact-checking-morrison-climate-change/15387480006957>

¹⁹ <https://reneweconomy.com.au/turnbull-dumps-emissions-from-neg-in-final-act-of-capitulation-30161/>

²⁰ <https://www.afr.com/news/politics/angus-taylor-slams-emission-policies-as-corporate-greed-dressed-up-as-saving-the-planet-20180916-h15ghw>

²¹ <https://www.theaustralian.com.au/national-affairs/climate/angus-taylormade-package-prolongs-coals-power/news-story/a886a5169745356076ef61c524328a12>

²² <https://www.theaustralian.com.au/opinion/direct-action-back-on-the-agenda/news-story/4a4925083ac3048e5450973339b1e4c9>

²³ <https://www.afr.com/news/climate-change-commitment-linked-to-regional-security-pm-20180910-h157g0>

²⁴ <https://www.alp.org.au/our-people/our-people/simon-obrien/>

²⁵ <https://www.theleader.com.au/story/5690237/bar-manager-takes-on-scomo-in-cook/?cs=1507>

²⁶ https://twitter.com/NSW_LEAN/status/1051402592071245824

²⁷ <https://www.smh.com.au/politics/federal/low-expectations-business-loses-hope-in-coalition-s-climate-credentials-as-eyes-turn-to-labor-20180904-p501px.html>

²⁸ <https://www.theaustralian.com.au/news/latest-news/resurrect-national-energy-policy-labor/news-story/ca836bb7c967bf73b4e60bac2f3ddc5d>

²⁹ <https://greens.org.au/candidates/nsw>

³⁰ <http://filefaustralia.org/greens-announce-dominic-wy-kanak-as-candidate-for-wentworth/>

ACF's priorities for climate action and nature protection can be found in its 2018 National Agenda.³¹ Among other things ACF's National Agenda calls on all people who seek to represent Australian communities in political office to:

- Set strong climate pollution reduction targets for Australia that are consistent with achieving zero net pollution well before 2050.
- Ensure clean energy powers 100 per cent of Australia's electricity generation by 2030, and 100 per cent of Australia's overall energy uses as soon as possible, but no later than 2040-2050.
- Make a national plan with policies to support the phased closure of Australia's coal-fired power stations by 2030 in conjunction with a comprehensive transition plan and package for workers and communities affected by the shift away from coal, oil and gas.

Note to Editors

The following quotes can be attributed to ACF Climate Change and Clean Energy Program Manager, Gavan McFadzean:

"Voters in Cook want to be represented by an MP who is as committed to climate change action as they are – whether they are the Prime Minister or a backbencher.

"If we do not make significant and rapid cuts climate pollution, the communities in Cook will keep getting hotter and drier. The people of Rockdale and the Shire would lose their existing seasonal patterns and gain a dangerous new extreme summer. Summer conditions would take over much of the year and more frequent extreme temperatures would put increased pressure on the health of Cook's more vulnerable residents.

"Australia is already experiencing climate damage. The Great Barrier Reef has been hit by successive mass coral bleaching events. Many parts of the country are amid worsening drought conditions. And we've seen numerous unseasonal bushfires throughout the most recent winter.

"We cannot let climate damage get worse. We need concerted global action through the Paris Agreement, with Australia doing its fair share. But Australia's pollution is rising, and we have no sensible national climate plan to turn that around.

"We must stop burning coal, and transition rapidly to clean energy like solar and wind power.

"All candidates seeking to represent the people of Cook in the next federal election must make a strong commitment, and produce detailed plans, to stop climate pollution and ensure the future safety of their community."

For more information or interviews please contact Tom Arup on 0402482910.

³¹

https://d3n8a8pro7vhmx.cloudfront.net/auscon/pages/5738/attachments/original/1527647927/28pp_ACF_National_Agenda_Ma_y_FINAL_WEB.pdf?1527647927