



RGSQ Bulletin

ISSN 1832-8830

May 2020

Vol 55 no 04

Published by The Royal Geographical Society of Queensland Ltd., a not-for-profit organisation established in 1885 that promotes the study of geography and encourages a greater understanding and enjoyment of the world around us.

Patron: H.E. Paul de Jersey AC, Governor of Queensland
President: Dr Iraphne Childs

Message from the Governor of Queensland



As Governor of Queensland and Patron of the Royal Geographical Society of Queensland, I was very pleased to receive an invitation from your President, Dr Iraphne Childs, to reach out to members through the RGSQ Bulletin at this challenging time.

His Excellency the Honourable Paul de Jersey AC, Governor of Queensland. Courtesy of Government House Queensland

It has been a difficult start to the year, with the Society's meetings, lectures and trips either cancelled or postponed in response to the COVID-19 pandemic, and I know that this experience is a matter of great concern to members. Let me reassure you that Kaye and I have you in our thoughts.

A once-in-a-lifetime event such as this demonstrates very clearly that the Society's diverse program of events does much more than contribute to improving public understanding of our community and environment. It also plays a vital role in promoting social cohesion by bringing people together to share conversations and collaborate in bringing ideas and plans to fruition. I am very much aware that you will all be missing this interaction.

Somewhat ironically, the COVID-19 pandemic will provide geographers with research opportunities for years to come. Now, however, as the Australian and Queensland governments consider how and when to reduce the restrictions imposed to combat the spread of the coronavirus, our focus must continue to be on remaining compliant, patient, and supportive.

I am confident that the Society, in common with other community-based organisations, will bounce back with renewed energy once this event has passed.

In the meantime, let me reiterate the message on your website – stay safe, but above all, stay curious!

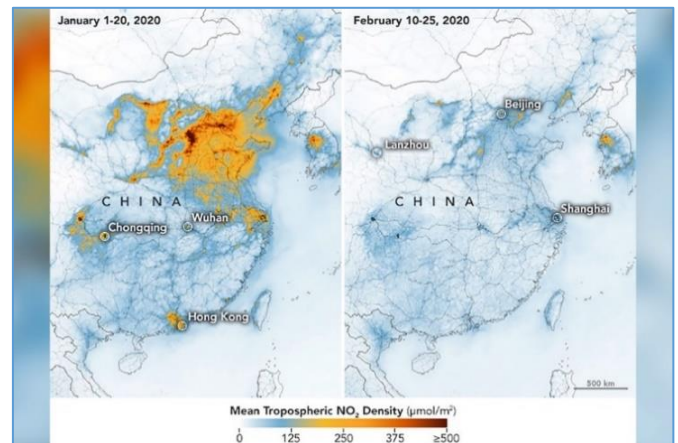
His Excellency the Honourable Paul de Jersey AC
Governor of Queensland

From the President

Dear Fellow Members, I hope you are all keeping safe and well as we cope with the COVID-19 virus. The pandemic is redefining our relationship with physical space: distance, proximity, spread, hot spots, and scale - in a word *Geography* – everyone is concerned with *where*. We are thinking about it on personal and local scales, navigating supermarket aisles and converting rooms into home offices. We are dealing with it at the regional scale, moving medical equipment from places with surplus to places in need. We listen to reports from epidemiologists functioning at national and global scales, as they work to understand how a virus could travel so far, so fast and cause such devastation.

Australia does seem to be coping well compared to some other parts of the world. As at this writing, our daily number of new cases has decreased to the point where some states have had no new cases and the government is planning to ease some restrictions.

If there are any positive outcomes of this pandemic, one, surely, has to be the reduction in air pollution around the world. Indeed, this is observable from space.



Nitrogen dioxide (NO₂) values across China from January 1-20, 2020 (before the quarantine) and February 10-25 (during the quarantine) which illustrates a significant decrease in NO₂ over China, partly related to the economic slowdown following the outbreak of the COVID-19. Source: NASA Earth Observatory

Satellites are a key component of global efforts to tackle air pollution. Data from many major cities show a strong correlation between reduced levels of air pollutants and actions taken to flatten the curve of the COVID-19 pandemic. Air pollution around the world has dropped as countries scale back economic activity

and drastically reduce travel by road and air. An important and encouraging lesson is that when we remove the sources of pollution, unhealthy air clears up almost overnight. As far as the environment and our health is concerned, this is an excellent thing. However, the lockdown in economic activity cannot continue and scientists warn that, unfortunately, the reprieve in air quality will only be short term. A surge in emissions as economies recover is likely to leave the environment again worse off. Achieving the inevitable transition to a low-carbon-low-polluting future is a major challenge. A weak global economy may threaten investment in renewable energy sources and associated long-term jobs, particularly, given the present availability of cheap oil and lobbying to develop more new coal mines for profits in the short-term.

“Could governments and economies view this clean-air episode as an opportunity to begin to re-align policies towards a sustainable future?”

Our cities may again breathe clean air, hopefully, sooner rather than later.

References:

Melissa Lunden and Meghan Thurlow *The stunning impact of COVID-19 social distancing on air pollution* (March 31, 2020) <https://www.greenbiz.com/article/stunning-impact-covid-19-social-distancing-air-pollution>

New York Post *China's skies are briefly clearer while factories stay shut* March 3, 2020

<https://nypost.com/2020/03/03/chinas-skies-are-briefly-clearer-while-factories-stay-shut/>

Gabriel da Silva, *COVID-19 drop in pollution to be short-lived* *Engineering & Technology* 30 March 2020

<https://pursuit.unimelb.edu.au/articles/covid-19-drop-in-pollution-to-be-short-lived>

RGSQ President
Dr. Iraphne Childs

UPCOMING EVENTS

www.rgsq.org.au

Dear members, due to COVID-19, further events on the RGSQ calendar have been impacted. Please see below:

Cancelled Events

CHRISTMAS IN JULY - scheduled for 14 July, communication will be sent to all registrants.

MAY LECTURE – *“Reimagining James Cook and Australian History”*. In lieu of the lecture, RGSQ member, Ralph Carlisle, has contributed an article examining the seminal question - “Who discovered Australia?”, pg. 4.

What's On?

MAP GROUP SEMINAR: 14 May

“Modern Mapping and GIS Techniques”

Note: the seminar will be delivered online. We will email information on accessing the seminar closer to the date.

Details: John Tasker (RGSQ Member) will provide some insights into modern mapping and GIS techniques used by government and industry and where this technology is heading.

JUNE THOMSON ORATION

“What Makes Geography Geographical?”

Presented by Alaric Maude

We are working with Alaric to bring you the June lecture in an online format, either as a recorded video to access through the website or YouTube or as an online webinar. More information about this will be emailed shortly.

Feature Story

Great Barrier Reef experiences its third mass coral bleaching in five years

By Dr. Emma Kennedy

The Great Barrier Reef (GBR) is currently experiencing its most widespread coral bleaching (a physiological response to heat stress) to date. In January, National Oceanic and Atmospheric Administration (NOAA) satellites detected warmer-than-usual sea surface temperatures, which continued through to March, with February breaking a record as the warmest since records began in 1900. With heat stress accumulating much faster than scientists originally anticipated, survey teams were scrambled from across regions and institutions to assess the impact on corals across the world-famous Marine Park's massive 344,400 sq. km extent. The 2020 mass coral bleaching marks the third major bleaching event in just five years.



Particularly concerning for scientists was the impact on the southern reefs, which had escaped recent mass bleachings in 2016 and 2017 and had been thriving despite crown-of-thorns outbreaks in the Swains. UQ's remote sensing research group surveyed the stunning Hardline Reefs last year as part of their project to map the Great Barrier Reef. Credit: Emma Kennedy

Aerial surveys conducted by Prof Terry Hughes from the Australian Research Centre (ARC) Centre of Excellence and the Great Barrier Reef Marine Park Authority's Dr James Kerry over a period of 9 days in late March gave scientists the best overview of the damage. Flying a light aircraft 150 m above the ocean, the team's flight path crisscrossed 1036 of the Great Barrier Reefs approx. 2900 reefs, giving researchers an opportunity to eyeball each reef and assign a score (either <1%, 1-10%, 10-30%, 30-60% or >60%) based on the estimated proportion of corals bleached white. Survey scores released in early April matched the footprint of the heat stress, which was concentrated on inshore reefs. While outer reefs and much of the northern area appeared to escape this bleaching, and some central reef areas – including the tourist areas of Cairns and Port Douglas – were spared, south of Cairns the damage was extensive. A quarter of all reefs surveyed were assigned a “severe bleaching” category (where >60% corals affected), and these reefs were found in every sector of the GBR for the first time. This makes the bleaching footprint the most widespread ever reported for the Reef, and just second to the 2016 GBR bleaching in terms of severity. Just 40% of reefs fell into the “no bleaching” >1% bleaching category. Dive teams were deployed to collect underwater field data to help verify aerial scores, although for many researchers – including my own *Remote Sensing*

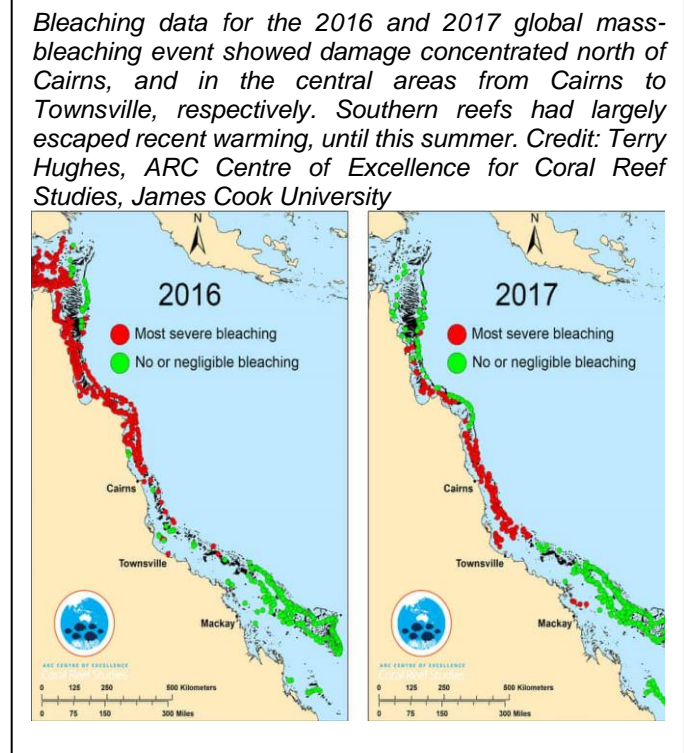
Research Centre lab trying to get to our reef sites at one of the worst affected areas in the Keppel Islands – COVID-19 restrictions limited our ability to access field sites.

currently on jobseeker payments due to coronavirus are going to be out of work permanently”. Meanwhile the Morrison Government has announced a \$100 million commitment (of the \$443 million given to the controversial Great Barrier Reef Foundation) towards a Reef Restoration and Adaptation Program (RRAP) to explore technological solutions from cloud brightening to larval reseedling of damaged areas.

While these innovations are exciting, without a concerted effort to reduce greenhouse gas emissions both at home and abroad, the future of the reef seems bleak. Corals are extremely vulnerable to elevated ocean temperatures. The 2019 IPCC report warned that limiting global warming to <math><1.5^{\circ}\text{C}</math> was critical to ensure the survival of functioning reef systems that support over a billion people by providing food, coastal protection, and jobs globally. In an online discussion on the scientific findings of the Great Barrier Reef surveys live-streamed to over 300 scientists and reef managers, James Cook University’s Prof Morgan Pratchett, involved in coordinating the bleaching response, said “we need to act to reduce the severity of bleaching events ... the only way to do that is to reduce carbon dioxide emissions”

“Our planet’s summer from hell is not over by any means”

As Australia’s long and desperate summer finally draws to an end, seasons shift and the heatwave migrates into the Indian Ocean, researchers in the Maldives are already noting the first signs of bleaching on their reefs. As we begin to survey the aftermath, scientists across the planet are now trying to find a way to check on their local reefs in this difficult time.

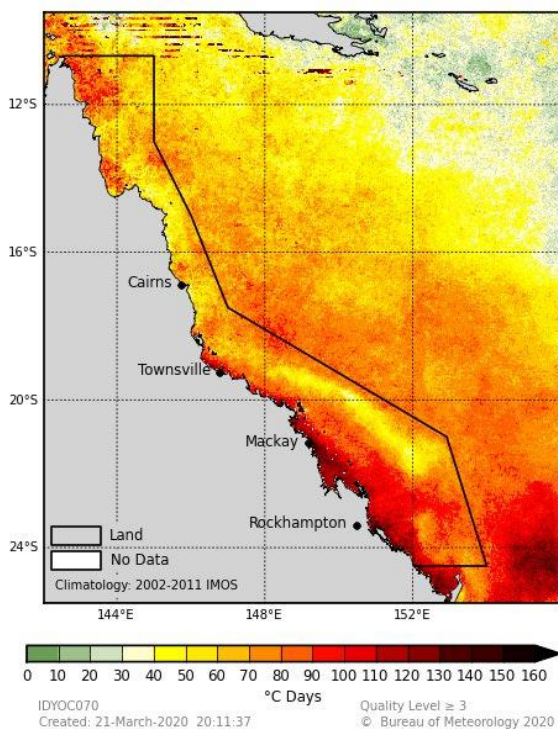


Of particular concern for scientists was the impact on the southern reefs, which had largely escaped the 2016 and 2017 mass bleaching events and had been thriving despite crown-of-thorns outbreaks in the Swains reefs. Catastrophic declines in the number and recruitment of corals followed the 2016 and 2017 events. Although some recovery has been observed, it is not known how this year’s bleaching has affected new coral recruits. The time between these major disturbances generally does not allow coral assemblages to recover. This kind of heatwave recurrence was not predicted until later into the 2030s. Part of the reason that little bleaching was documented in the Far Northern Reef areas is that most of the reefs there are extremely damaged, making the small number of living corals harder to observe from above, a phenomenon scientists have dubbed “ecological memory”, or “dead reefs can’t bleach”.

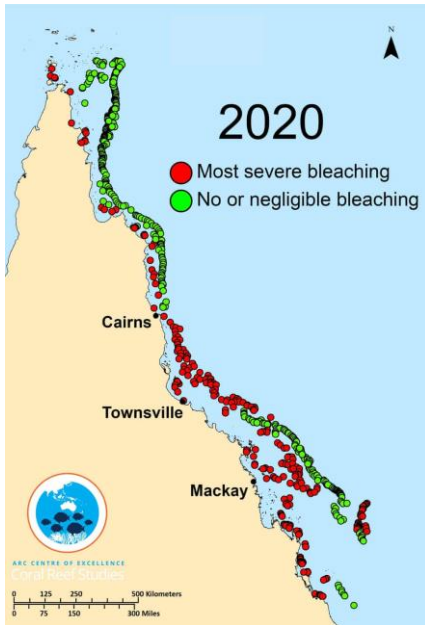
While events on the Great Barrier Reef often focus media attention, the bleaching was not just restricted to the Park: in February, our dive team returned from the remote Coral Sea after surveying kilometres of corals. Coral bleaching does not always equate to mortality. Generally, warmer-than-normal temperatures (defined by scientists as “Degree Heating Weeks” DHWs – the period of time water temperature remains >1 degree C above the maximum monthly mean for that area) that exceed 6 DHWs are associated with significant coral loss. Accumulated heat stress was not as high in 2020 as in 2016. As we transition into winter, temperatures are starting to cool, and the stress is beginning to alleviate. Only with time will scientists be able to understand the true long-term impacts of this summer’s heatwave.

With 64,000 Australian jobs reliant on the Reef, the economic impacts of bleaching could be felt for years to come. The GBR brings in an estimated \$6.4 billion to the economy. Dive Instructor Tanya Murphy described it as “Gut wrenching - unless we cut down on carbon pollution urgently, tens of thousands of tourism workers like me who are

IMOS 14-Day Mosaic: DHD
21 March 2020 GBR region



Heat stress data from the Bureau of Meteorology shows “Degree Heating Days” an accumulation of above-average warm days (climatology taken from 1993-2003) over the Australian summer (1st Dec to 31st March), derived from IMOS L3S AVHRR sea surface temperature (SST) products. Heat stress accumulated on southern inshore reefs this summer. Credit: BOM



The Great Barrier Reef, indicating location of surveyed reefs that were most severely affected (more than 60% corals estimated to be bleaching red circles) and those that were least impacted (<1% corals bleaching, green circles) by the heatwave. In total, 1036 reefs were surveyed. Credit: Terry Hughes, ARC Centre of Excellence for Coral Reef Studies, James Cook University



Bleaching corals in the Keppel Islands. The Keppel Islands near Rockhampton were one of the worst affected areas, but because of COVID-19 restrictions, University of Queensland scientists were not able to access their reef sites to assess bleaching impact. Credit: Oliver Lanyon

Finding Australia

By Ralph Carlisle

In 2020, Australia is celebrating the 250th anniversary of the voyage of (then) Lieutenant James Cook in His Majesty's Braque *Endeavour* along the east coast of the continent. Some people say that Cook 'discovered' Australia. In this article, I will look at the question 'Who found Australia?'

The ancestors of Australia's Aborigines found this land 60 thousand years ago or more, when sea levels were 60-80 meters below current levels. They could have walked from Africa into South-West Asia, then around the coast to South-East Asia. Many of the current islands of South-East Asia were joined into a landmass we now call Sunda. Australia and New Guinea were joined together as Sahul. But large stretches of water (tens of kilometers) remained between Sunda and Sahul. Early humans crossed those waters – a magnificent feat by the world's first mariners.

They likely travelled by one of two routes – the northern route – sailing from Borneo and Sulawesi to the 'bird's head' of New Guinea then walking south to Carpentaria (now underwater)

and Arnhem Land or the southern route from Timor and nearby islands to the Kimberley region of Western Australia. From there, they could walk to occupy the rest of the Australian landmass, including Tasmania (then connected to the mainland). See Fig. 1.

They had the continent to themselves for tens of thousands of years. But there must have been some contact with South-East Asia. Archaeological studies show that dingoes were not present in Tasmania, meaning that they arrived on the Australian mainland after 12 thousand years ago when that island became separated from the mainland by rising sea levels. The earliest archaeological evidence suggests they arrived some 4 thousand years ago. How did they get here? Surely, they did not dog paddle!

Fishermen sailed between Makassar and Arnhem Land several centuries ago. Possibly such trade was occurring long before then.

Torres Strait Islanders appear to be related to Papuans but are culturally very different. Although Papuans are believed to have arrived in New Guinea tens of thousands of years ago, I have not been able to find out when the ancestors of TSI arrived in that strait.

There are stories of Chinese and Portuguese arriving in Australia in the 1400s and 1500s but there is very little hard evidence to support those stories.

In the 1500s, European maps were drawn showing a large land mass (Java la Grande) south of Java with the eastern side bearing a passing, but imperfect, resemblance to the east coast of Australia, however, the land is shown too far west. At the time, measuring longitude was not accurate and the Portuguese had an international political interest in making their finds located to the west.

In 1606, the Dutch navigator, Willem Jansz, sailed south along the western coast of Cape York Peninsula to Cape Keerweer, near Weipa. He is credited with being the first European to sight Australia. The Spaniard, Luis Vaz de Torres, sailed through Torres Strait to Batavia (now Jakarta) a few months later, but he records that he sailed on the New Guinea side of the strait.

The original sailing route from Europe to South-East Asia hugged the African coast and crossed the Indian Ocean in the north. In 1611, the Dutch sailor Hendrik de Brouwer found a faster way by keeping to the south when sailing across the ocean, being blown along by the Roaring Forties. This required a left turn to sail north to Java. If this turn were left too late, ships would sight Western Australia.

Hence, many Dutch mariners saw parts of the WA coastline, sometimes tragically ending in shipwreck. As the Dutch East India Company required its ships' captains to record their sightings and forward them to a company cartographer, the Dutch gradually built a map of the western coast of Australia.

On his first voyage in 1642, Abel Tasman discovered Tasmania and New Zealand. But on his second voyage in 1644, he mapped from Cape York westward along the coast to North-West Cape in WA – at more than 4700 km, a longer distance than Cook's voyage along the east coast over a century later.

By 1663, the Dutch were able to publish a map of New Holland showing the north and west coasts and the south coast east to the Top of the Bight. See Fig. 2.

Cook famously sailed along the east coast of Australia (over 4000 km) in 1770, sailing through Torres Strait direct to Batavia.

Matthew Flinders is credited with being the first person to sail around Australia (in 1802-03) but he did not sail close to the coast all the way (strictly, Tasman can be said to have circumnavigated Australia in 1642-43 but his closest approach was to Tasmania only). On his journey from England to Sydney in 1802, Flinders had unexpectedly met the French navigator Nicolas Baudin at Encounter Bay, South Australia.

Upon return to France, Baudin's cartographer, Louis de Freycinet, drew on the charts of previous navigators and, in 1811, published the first map showing the full outline of Australia as we now know it, though it had some omissions and distortions. The map published by Flinders in 1814, also showed the outline of Australia, but suffered from similar omissions and distortions.

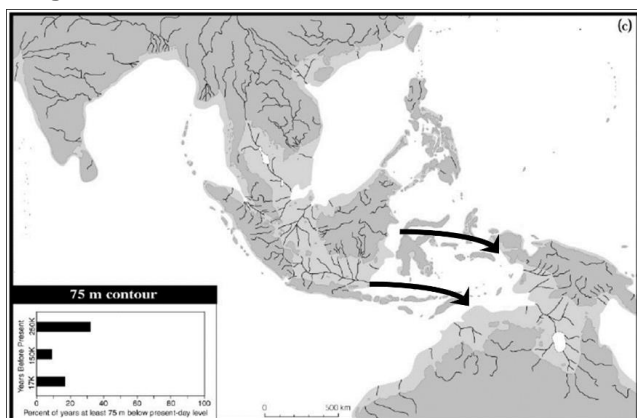
It remained for Philip Parker King (son of former NSW Governor King) to make a series of voyages in 1817-1822 to fill in the gaps from earlier work. See Fig. 3.

So, who should be given credit for 'finding Australia'? In the first instance, it should be our Indigenous people. Amongst Europeans, numerous Dutch navigators deserve great credit. Tasman and Cook each made most impressive contributions. Flinders, Baudin, Freycinet and King completed the picture.

References:

- Clarkson, Chris et al. (June 2015). "The archaeology, chronology and stratigraphy of Madjedbebe (Malakunanja II): A site in northern Australia with early occupation". *Journal of Human Evolution*. 83: 46–64.
also
"Human occupation of northern Australia by 65,000 years ago" Chris Clarkson et al, *Nature* volume 547, pages 306–310 (2017)
<https://www.nature.com/articles/nature22968>
- Australian Museum, 2019; Dingo
<https://australianmuseum.net.au/learn/animals/mammals/dingo/>
- Mulvaney J, Kamminga J (1999) "Prehistory of Australia" Smithsonian Institution Press, Washington, DC quoted in: Oskarsson, M. et al. Narrow genetic basis for the Australian dingo confirmed through analysis of paternal ancestry:
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3386486/>

Images:



1. Possible sea routes between Sunda and Sahul 60-70 thousand years ago.

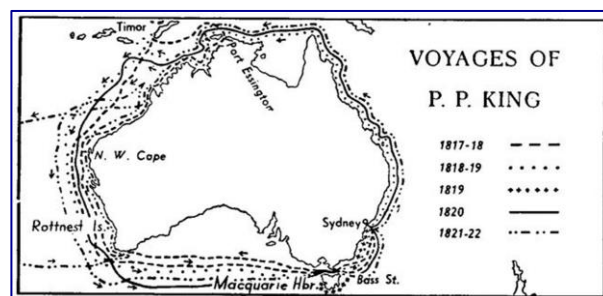
Map taken from Voris, H. K. (2000) *Maps of Pleistocene sea levels in Southeast Asia: shorelines, river systems and time durations*

Journal of Biogeography, 27, 1153–1167

<https://www.researchgate.net/publication/227696790>
[Maps of Pleistocene sea levels in Southeast Asia](https://www.researchgate.net/publication/227696790)
[Shorelines river systems and time durations](https://www.researchgate.net/publication/227696790)



2. A Complete map of the Southern Continent [cartographic material] / survey'd by Capt. Abel Tasman and depicted by order of the East India Company in Holland in the Stadt House at Amsterdam; 1767
<https://catalogue.nla.gov.au/Record/2650522>



3. Voyages of P.P. King 1817-1822
https://en.wikipedia.org/wiki/Phillip_Parker_King

Still curious? Find out more about Captain Cook's 1770 Endeavor Voyage, visit the National Museum of Australia website:

<https://www.nma.gov.au/exhibitions/endeavour-voyage>



Vale, Patrick McKewin

It is with great sadness that we let the RGSQ members know that Patrick James McKewin died on 24th of April at the Royal Brisbane and Women's Hospital. He slipped away peacefully surrounded by his daughters. Patrick joined the Society in 2015 and many members will remember him from the monthly lectures, outings and help with competition mail-outs. Patrick will be missed by the RGSQ community. We send our deepest sympathies to his daughters and close friend Sue Reid. May he rest in peace.

What's happening on Council?

On 21 April Council had an online meeting using RGSQ Microsoft Teams software. Thanks to John Tasker for setting this up. As expected, much of the discussion focused on the impacts of COVID-19 on RGSQ:

- our current financial situation and the prospects for the next few months
- applying for the JobKeeper and other government stimulus packages
- postponement/cancellation of trips
- publication of the Bulletin and MemberConnect newsletter
- development of more online content for members during the closure

Much is still going on behind the scenes despite COVID-19 restrictions. We had comprehensive reports from the Business Manager (Lilia Darii), the AGC (Kath Berg), Property (Pamela Tonkin), Treasurer (Chris Spriggs), the President (Iraphne Childs) and Young Geographers (John Tasker).

At present, Stradbroke Island is off-limits so we are unable to proceed with our plans for developing a Scientific Study there. Meanwhile there are some plans to initiate a virtual activity with Map Group members.

RGSQ Bulletin

May 2020

- Message from the Governor of Queensland
- Cancelled/postponed events
- What's On?
- Great Barrier Reef experiences its third mass coral bleaching in five years
- Who discovered Australia?

**W: www.rgsq.org.au
E: info@rgsq.org.au
P: 07 3368 2066**

The May Council will meet on the third Tuesday of the month.

The Royal Geographical Society of Queensland Ltd
PO Box 625, Spring Hill QLD 4004

**POSTAGE
PAID
AUSTRALIA**