



Government of **Western Australia**  
Department of **Mines, Industry Regulation  
and Safety**

# Calendar 2021



Perth

Geological Survey of  
Western Australia







January



| Monday | Tuesday          | Wednesday | Thursday | Friday           | Saturday | Sunday |
|--------|------------------|-----------|----------|------------------|----------|--------|
|        |                  |           |          | New Year's Day 1 | 2        | 3      |
| 4      | 5                | 6         | 7        | 8                | 9        | 10     |
| 11     | 12               | 13        | 14       | 15               | 16       | 17     |
| 18     | 19               | 20        | 21       | 22               | 23       | 24     |
| 25     | Australia Day 26 | 27        | 28       | 29               | 30       | 31     |



Geological Survey of  
Western Australia

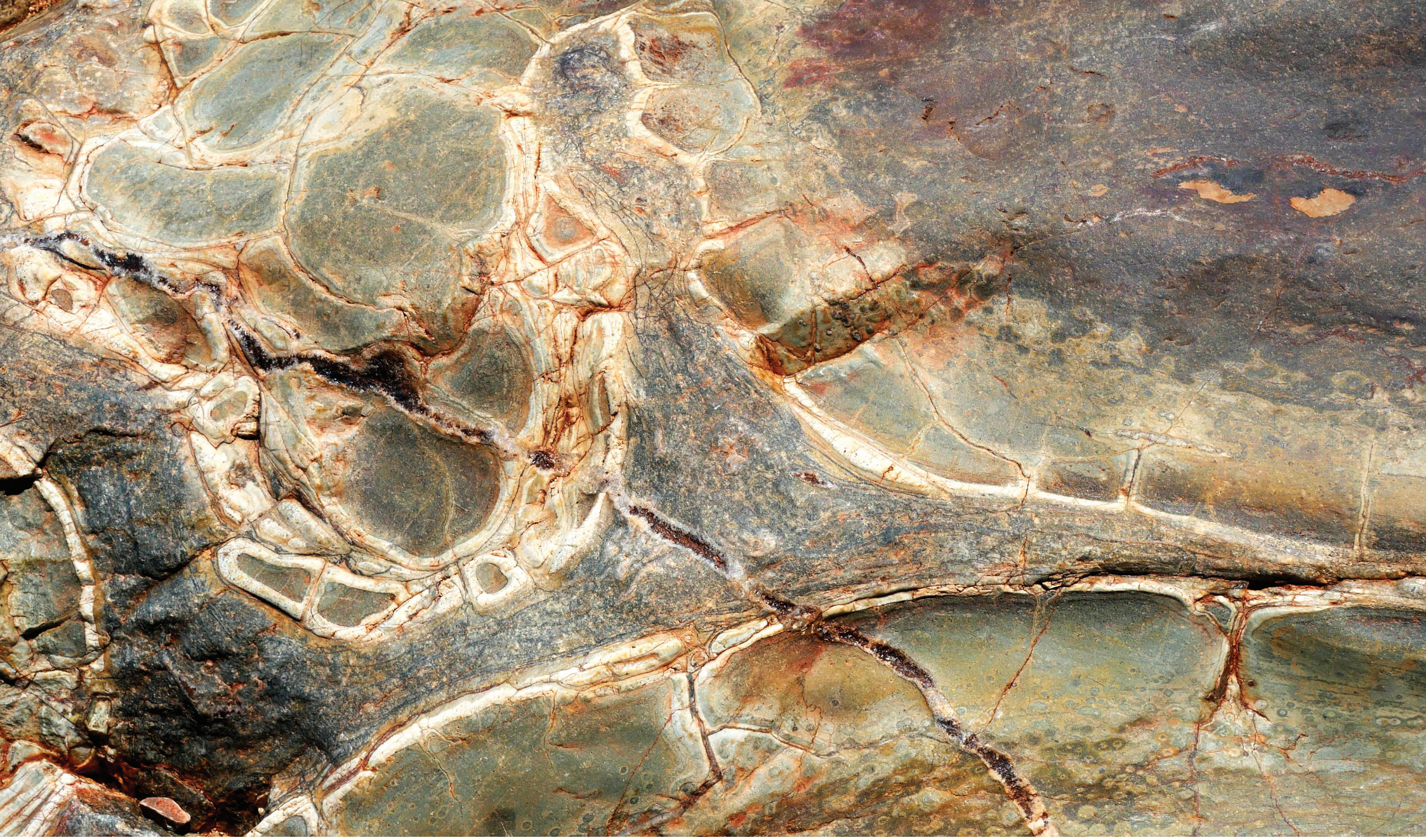


# January 2021

*Salty waves along the Bunbury foreshore at Casuarina Point smash against jointed columns of Bunbury Basalt, distinctive for its plagioclase phenocrysts. These rocks formed during volcanic eruptions 130 million years ago, as greater India and Australia parted ways during the breakup of eastern Gondwana and the opening of the Indian Ocean*

*Photo by Michael Wingate*





February



| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|--------|---------|-----------|----------|--------|----------|--------|
| 1      | 2       | 3         | 4        | 5      | 6        | 7      |
| 8      | 9       | 10        | 11       | 12     | 13       | 14     |
| 15     | 16      | 17        | 18       | 19     | 20       | 21     |
| 22     | 23      | 24        | 25       | 26     | 27       | 28     |
|        |         |           |          |        |          |        |



Geological Survey of  
Western Australia



# February 2021

*Pillowed forms of the Apex Basalt (3460–3440 Ma) near Marble Bar resemble an ancient crocodile skin: curved glassy margins where the lava cooled rapidly envelop darker cores with concentric arrays of vesicles; and an interpillow matrix of hardened sediment and hyaloclastite intimately cradles the entwined pillows. Field of view is 50 cm across*

*Photo by Charlotte Hall*





March



| Monday            | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|-------------------|---------|-----------|----------|--------|----------|--------|
| Labour Day (WA) 1 | 2       | 3         | 4        | 5      | 6        | 7      |
| 8                 | 9       | 10        | 11       | 12     | 13       | 14     |
| 15                | 16      | 17        | 18       | 19     | 20       | 21     |
| 22                | 23      | 24        | 25       | 26     | 27       | 28     |
| 29                | 30      | 31        |          |        |          |        |



Geological Survey of  
Western Australia



# March 2021

Sunset falls on seven-inch diameter drill casing as it awaits deployment into the depths of the Waukarlycarly Embayment, southwestern Canning Basin. Stratigraphic drillhole Waukarlycarly 1 was successfully drilled by DDH1's ER01 rig, reaching a total depth of 2680.53 m within weakly metamorphosed dolomite of the Yeneena Basin. This project was jointly funded by Commonwealth and State Governments

Photo by Leon Normore





April



| Monday          | Tuesday | Wednesday | Thursday | Friday        | Saturday | Sunday          |
|-----------------|---------|-----------|----------|---------------|----------|-----------------|
|                 |         |           |          |               |          |                 |
|                 |         |           | 1        | Good Friday 2 | 3        | Easter Sunday 4 |
|                 |         |           |          |               |          |                 |
| Easter Monday 5 | 6       | 7         | 8        | 9             | 10       | 11              |
|                 |         |           |          |               |          |                 |
| 12              | 13      | 14        | 15       | 16            | 17       | 18              |
|                 |         |           |          |               |          |                 |
| 19              | 20      | 21        | 22       | 23            | 24       | Anzac Day 25    |
|                 |         |           |          |               |          |                 |
| 26              | 27      | 28        | 29       | 30            |          |                 |

Geologists' Day 4 April



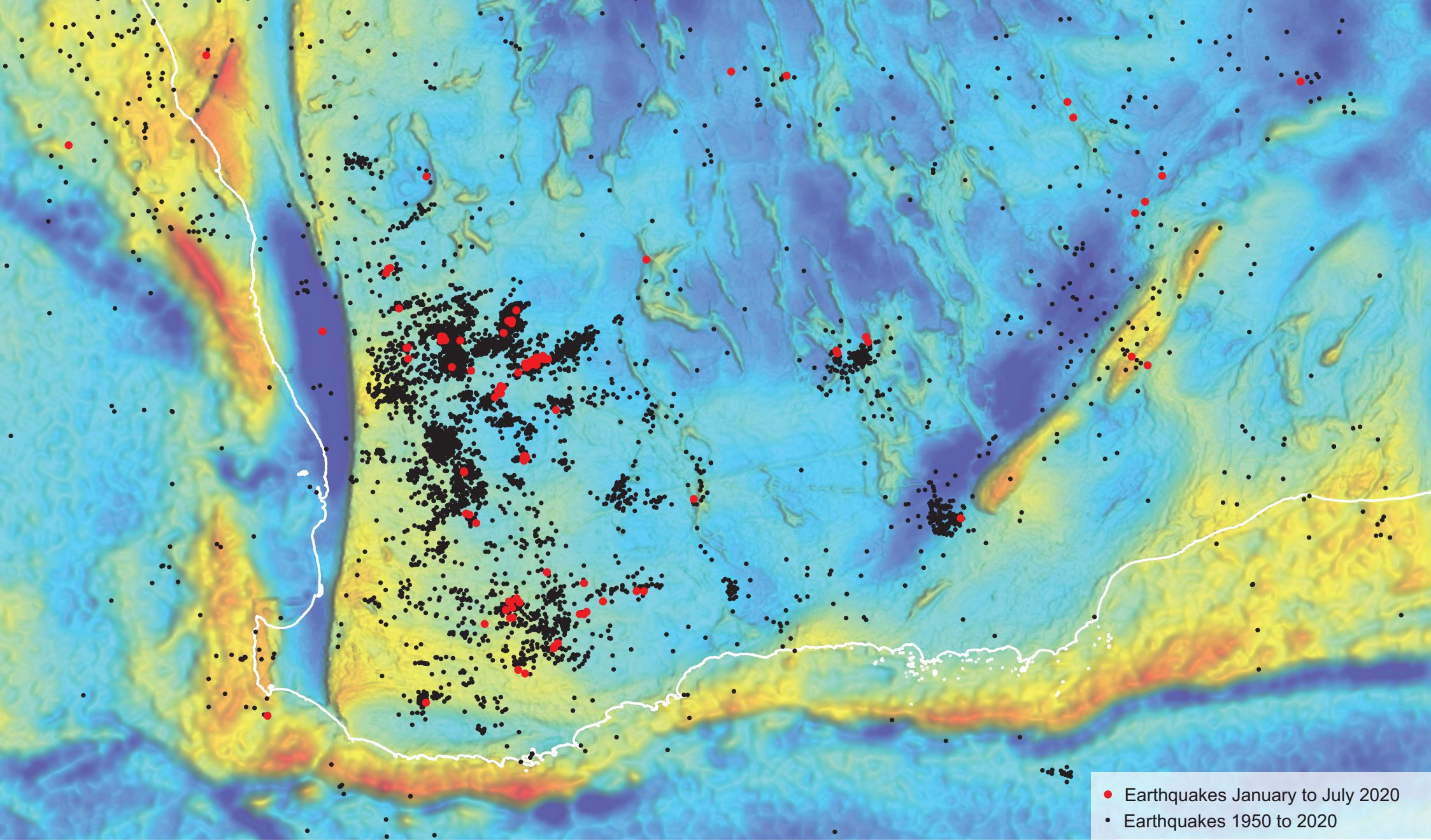
Geological Survey of  
Western Australia



# April 2021

*Emus wander among scattered, wind-swept outcrops of Tamala Limestone, an eolianite limestone less than one million years old that stretches along the coast of Western Australia from Albany to Shark Bay. The Tamala Limestone owes its origin to blustery conditions similar to those that are weathering it now*

*Photo by Ivan Zibra*



May



| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|--------|---------|-----------|----------|--------|----------|--------|
| 31     |         |           |          |        | 1        | 2      |
| 3      | 4       | 5         | 6        | 7      | 8        | 9      |
| 10     | 11      | 12        | 13       | 14     | 15       | 16     |
| 17     | 18      | 19        | 20       | 21     | 22       | 23     |
| 24     | 25      | 26        | 27       | 28     | 29       | 30     |



Geological Survey of  
Western Australia

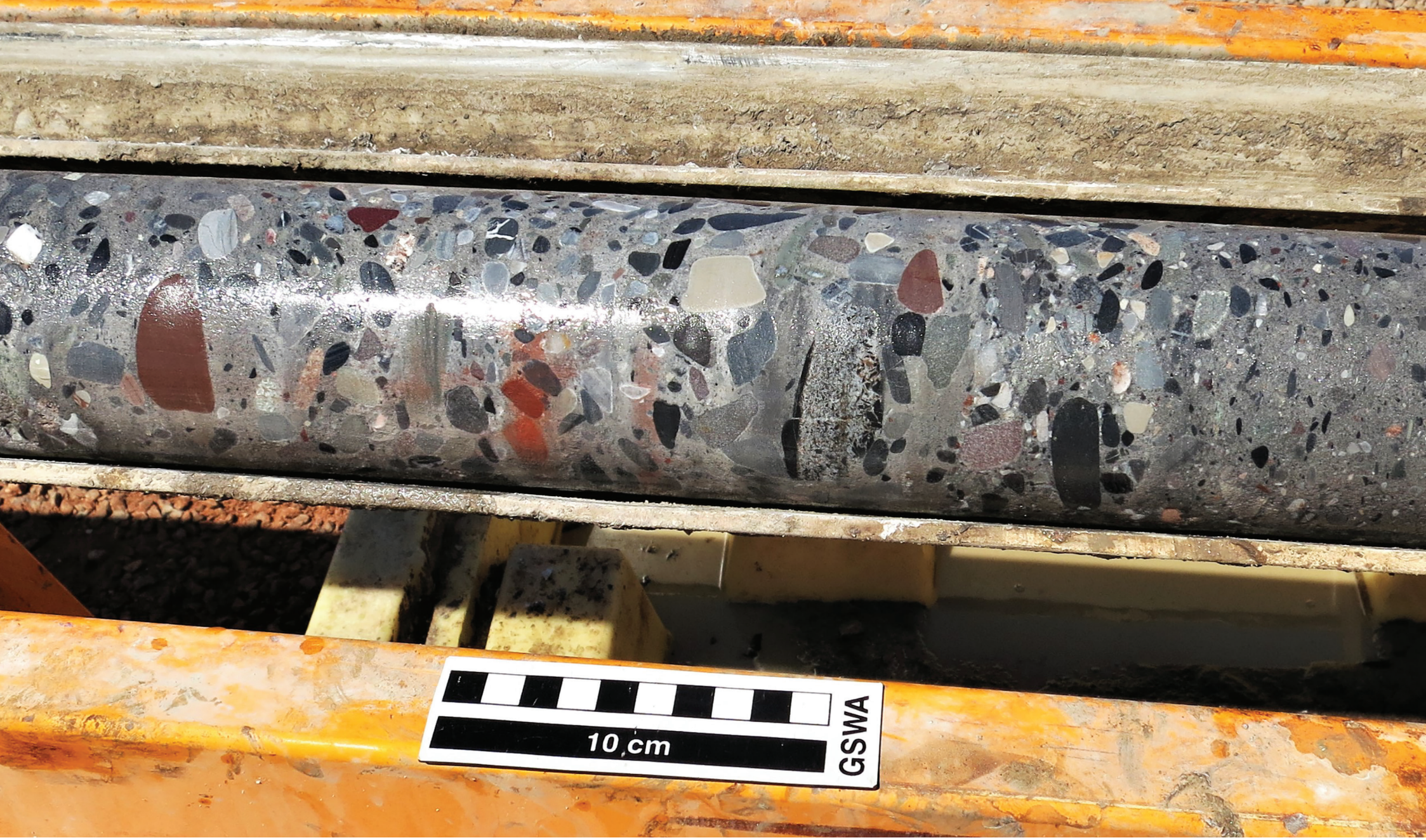


# May 2021

*Looking like peppercorns spilled across a Bouguer gravity image of southwestern Western Australia, the locations of low-magnitude earthquakes that frequently shake this region are clustered in space and time. Unusually, few of these tremors are associated with major structures, and they rarely rupture the Earth's surface. Past and current earthquake data can be viewed on Geoscience Australia's website ([www.earthquakes.ga.gov.au](http://www.earthquakes.ga.gov.au))*

*Image Lucy Brisbout and Geoscience Australia*





June



| Monday                  | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|-------------------------|---------|-----------|----------|--------|----------|--------|
|                         | 1       | 2         | 3        | 4      | 5        | 6      |
| Western Australia Day 7 | 8       | 9         | 10       | 11     | 12       | 13     |
| 14                      | 15      | 16        | 17       | 18     | 19       | 20     |
| 21                      | 22      | 23        | 24       | 25     | 26       | 27     |
| 28                      | 29      | 30        |          |        |          |        |



Geological Survey of  
Western Australia



# June 2021

*Just out of the core barrel, these multicoloured river pebbles in a Grant Group conglomerate last saw the light of day about 300 million years ago during the Late Paleozoic ice age. The core was recovered during drilling of the Waukarlycarly 1 stratigraphic drillhole on the southwestern margin of the Canning Basin*

*Photo by Peter Haines*





July



| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|--------|---------|-----------|----------|--------|----------|--------|
|        |         |           | 1        | 2      | 3        | 4      |
| 5      | 6       | 7         | 8        | 9      | 10       | 11     |
| 12     | 13      | 14        | 15       | 16     | 17       | 18     |
| 19     | 20      | 21        | 22       | 23     | 24       | 25     |
| 26     | 27      | 28        | 29       | 30     | 31       |        |



Geological Survey of  
Western Australia



July 2020

*This wave-like cuesta embraces the lower scrubland about 10 km south of the Ashburton River near Mount Vernon. The landscape results from the contrast in weathering resistance of sedimentary rocks where ~1100 million-year-old silicified Calyie Formation forms a resistant cap over softer siltstone, mudstone and sandstone of the Backdoor Formation*

*Photo by Olga Blay*





August



| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|--------|---------|-----------|----------|--------|----------|--------|
| 30     | 31      |           |          |        |          | 1      |
| 2      | 3       | 4         | 5        | 6      | 7        | 8      |
| 9      | 10      | 11        | 12       | 13     | 14       | 15     |
| 16     | 17      | 18        | 19       | 20     | 21       | 22     |
| 23     | 24      | 25        | 26       | 27     | 28       | 29     |

National Science Week 14–22 August



Geological Survey of  
Western Australia



# August 2021

*These strikingly coloured, folded metasedimentary rocks in a small cave of the Hamersley Gorge, southern Pilbara region, resemble a multilayered strawberries-and-cream cake. Hamersley Gorge is the most remote of all the gorges in the Karijini National Park and dramatically displays the forces that shaped the rocks in that area*

*Photo by Lucy Brisbout*





September



| Monday                   | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|--------------------------|---------|-----------|----------|--------|----------|--------|
|                          |         | 1         | 2        | 3      | 4        | 5      |
| 6                        | 7       | 8         | 9        | 10     | 11       | 12     |
| 13                       | 14      | 15        | 16       | 17     | 18       | 19     |
| 20                       | 21      | 22        | 23       | 24     | 25       | 26     |
| Queen's Birthday (WA) 27 | 28      | 29        | 30       | 31     |          |        |



Geological Survey of  
Western Australia



# September 2021

*Outcrops of sandstone protrude from this western Pilbara landscape like quills of a sunburnt porcupine. Very fine-grained, finely laminated Paleoproterozoic Ashburton Formation (~1800 million years old) is overprinted by an intense cleavage (S1) that is parallel to the sandstone bedding (S0), reflecting the strong tectonic deformation of the area*

*Photo by Bernd Striewski*





October



| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|--------|---------|-----------|----------|--------|----------|--------|
|        |         |           |          |        |          |        |
|        |         |           |          | 1      | 2        | 3      |
| 4      | 5       | 6         | 7        | 8      | 9        | 10     |
| 11     | 12      | 13        | 14       | 15     | 16       | 17     |
| 18     | 19      | 20        | 21       | 22     | 23       | 24     |
| 25     | 26      | 27        | 28       | 29     | 30       | 31     |

Earth Science Week 10–16 October

*Stromatolites are remarkably abundant in the Duck Creek Dolomite, an early Proterozoic unit in the Wyloo Group, exposed in the Duck Creek Gorge, western Pilbara. These microbialites record an ecosystem that thrived about 1800 million years ago.*

*Photo by Bernd Striewski*



Geological Survey of  
Western Australia



# October 2021





November



| Monday | Tuesday | Wednesday  | Thursday | Friday | Saturday | Sunday |
|--------|---------|------------|----------|--------|----------|--------|
| 1      | 2       | 3          | 4        | 5      | 6        | 7      |
| 8      | 9       | 10         | 11       | 12     | 13       | 14     |
| 15     | 16      | GIS Day 17 | 18       | 19     | 20       | 21     |
| 22     | 23      | 24         | 25       | 26     | 27       | 28     |
| 29     | 30      |            |          |        |          |        |



Geological Survey of  
Western Australia

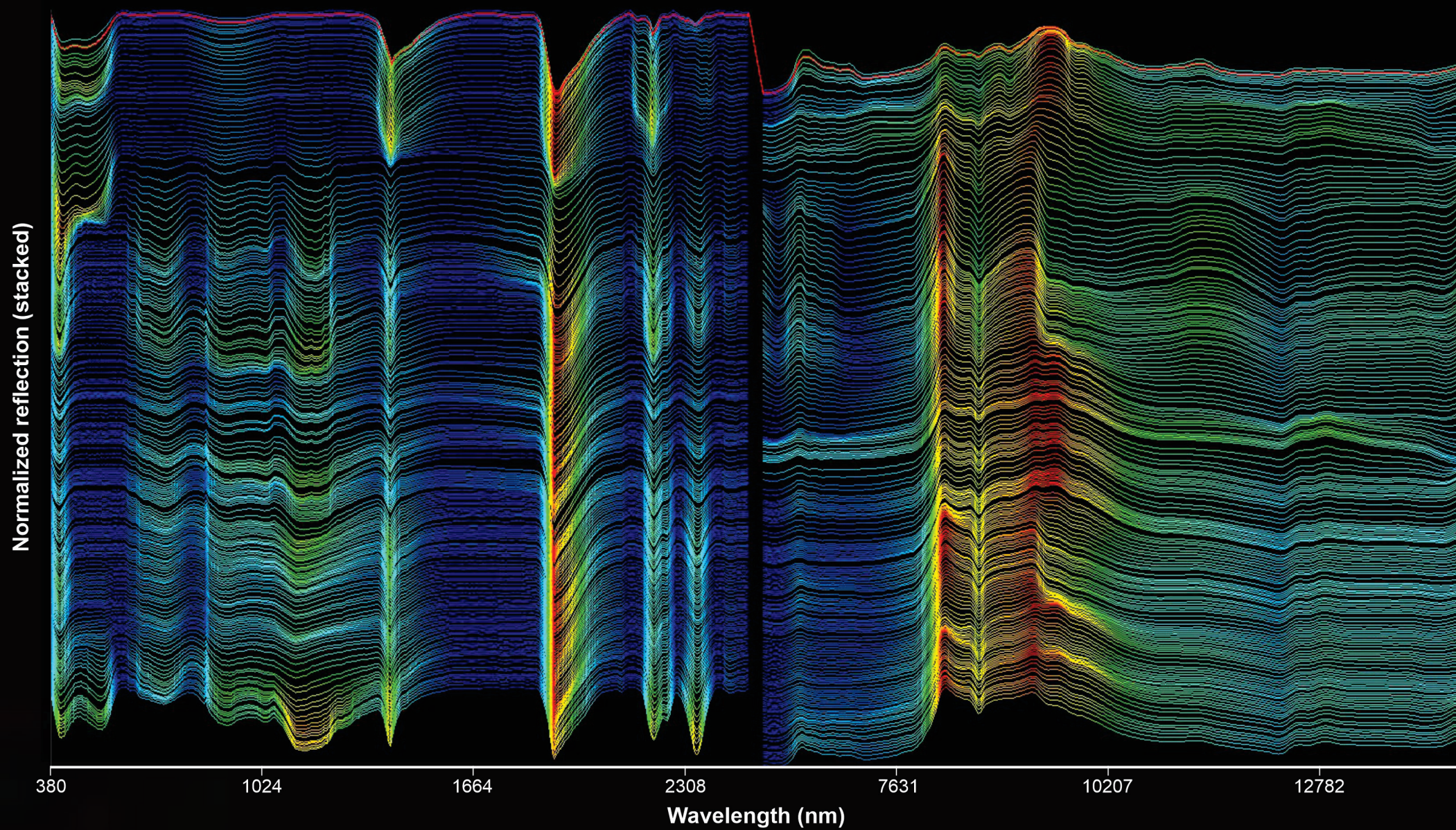


# November 2021

*These dramatic cliffs in d'Entrecasteaux National Park, just west of Windy Harbour, are close to 100 m high. Erosion of softer material has exposed calcified solution pipes several metres long in eolian carbonate rocks of the Pleistocene to Holocene Tamala Limestone*

*Photo by Michael Wingate*





December



| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday            | Sunday        |
|--------|---------|-----------|----------|--------|---------------------|---------------|
|        |         | 1         | 2        | 3      | St Barbara's Day* 4 | 5             |
| 6      | 7       | 8         | 9        | 10     | 11                  | 12            |
| 13     | 14      | 15        | 16       | 17     | 18                  | 19            |
| 20     | 21      | 22        | 23       | 24     | Christmas Day 25    | Boxing Day 26 |
| 27     | 28      | 29        | 30       | 31     |                     |               |

\*St Barbara is the patron saint of miners



Geological Survey of  
Western Australia



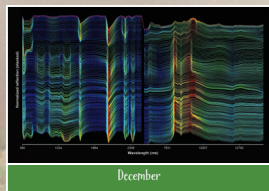
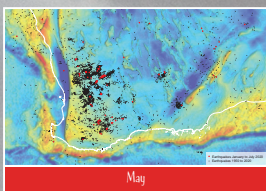
# December 2021

*A curtain of rainbow colours brings to life HyLogger spectral data acquired from samples of ditch cuttings collected at 3-m intervals in the Waukarlycarly 1 stratigraphic drillhole, southwestern Canning Basin. Regolith and rocks of the Carboniferous–Permian Grant Group were sampled from the surface down to 579 m. Signatures of ferric oxide, sericite–illite, kaolinite, quartz and albite are revealed to the experienced eye*  
Image prepared by Lena Hancock and Adam Symonds





Long cinnamon beaches are interrupted by Mesozoic and Quaternary sandstone which headbutts its way into the turquoise sea at Cape Leveque, 220 km north of Broome in the Kimberley region of Western Australia. Named after Pierre Leveque, a hydrographer on the French ship Geographe, which visited in 1803, the cape is called Kooljaman by the Bardi people who are the custodians of this land  
Photo by Robin Bower



A storm brews near the Paulsens Gold mine in the Wyloo Inlier, northwestern Gascoyne region. Fieldwork for the day was cut short due to strong winds causing this menacing dust storm. The race was on to get back to camp before rain flooded all access tracks  
Photo by Imogen Fielding

## MINISTER FOR MINES AND PETROLEUM

Hon. Bill Johnston MLA

## DIRECTOR GENERAL DEPARTMENT OF MINES, INDUSTRY REGULATION AND SAFETY

David Smith

## EXECUTIVE DIRECTOR GEOLOGICAL SURVEY AND RESOURCE STRATEGY

Jeff Haworth

ISBN 978-1-74168-907-5 (online); 978-1-74168-906-8 (print)

The Geological Survey of Western Australia (GSWA), a division of the Department of Mines, Industry Regulation and Safety (DMIRS), carries out geoscientific studies that reveal the geological framework and evolution of Western Australia, and the potential for mineral and energy resources.

GSWA publishes a vast amount of pre-competitive geoscience information on the State, contributing to billions of dollars' worth of resources for exploration and development.

DMIRS manages the Exploration Incentive Scheme (EIS), a State Government initiative to encourage exploration in Western Australia for the long-term sustainability of the State's resources sector. For more information about EIS, go to <[www.dmirs.wa.gov.au/eisdrilling](http://www.dmirs.wa.gov.au/eisdrilling)>.

The photographs for this calendar were taken by DMIRS staff during field activities in remote and beautiful locations throughout the State.

### Disclaimer

This product uses information from various sources. The Department of Mines, Industry Regulation and Safety (DMIRS) and the State cannot guarantee the accuracy, currency or completeness of the information. Neither the department nor the State of Western Australia nor any employee or agent of the department shall be responsible or liable for any loss, damage or injury arising from the use of or reliance on any information, data or advice (including incomplete, out of date, incorrect, inaccurate or misleading information, data or advice) expressed or implied in, or coming from, this publication or incorporated into it by reference, by any person whatsoever.

### Published 2020 by the Geological Survey of Western Australia

This calendar is published in digital format (PDF) and is available online at <[www.dmirs.wa.gov.au/GSWApublications](http://www.dmirs.wa.gov.au/GSWApublications)>.



© State of Western Australia (Department of Mines, Industry Regulation and Safety) 2020

With the exception of the Western Australian Coat of Arms and other logos, and where otherwise noted, this product is provided under a Creative Commons Attribution 4.0 International Licence. (<http://creativecommons.org/licenses/by/4.0/legalcode>)

Further details of geoscience products are available from:  
Information Centre Department of Mines, Industry Regulation and Safety  
100 Plain Street EAST PERTH WA 6004  
Tel: +61 8 9222 3459 | Email: [publications@dmirs.wa.gov.au](mailto:publications@dmirs.wa.gov.au)  
[www.dmirs.wa.gov.au/GSWApublications](http://www.dmirs.wa.gov.au/GSWApublications)

