

Kuyani-Witchelina Geotours – Google



University of
South Australia





IDEYAKA
HILL ➔



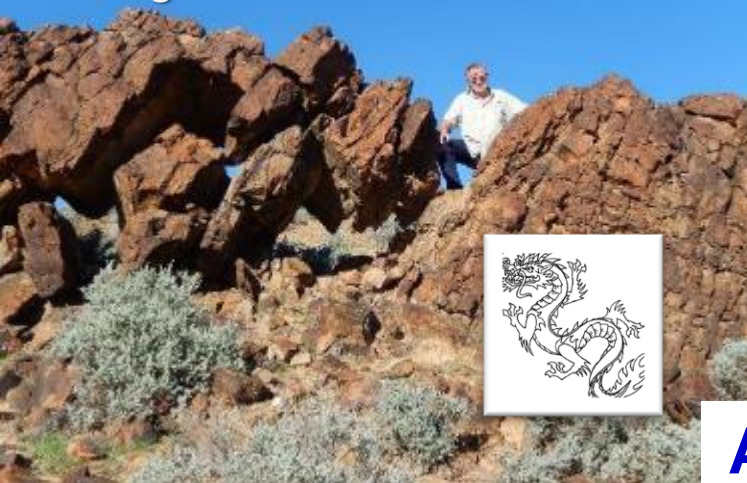

IDEYAKA
HILL 







“Dragons Tail” Hole in the Wall



“Bubble Rocks” Gulley



Ridgetop Drive Zig-Zag folds

An inventory of Witchelina Geosites (50)

**Geodiversity &
Geointerpretation
Geoconservation &
Geoheritage**

“Snakes Head” Sculpture valley



SA Geological Monuments/Geoheritage sites

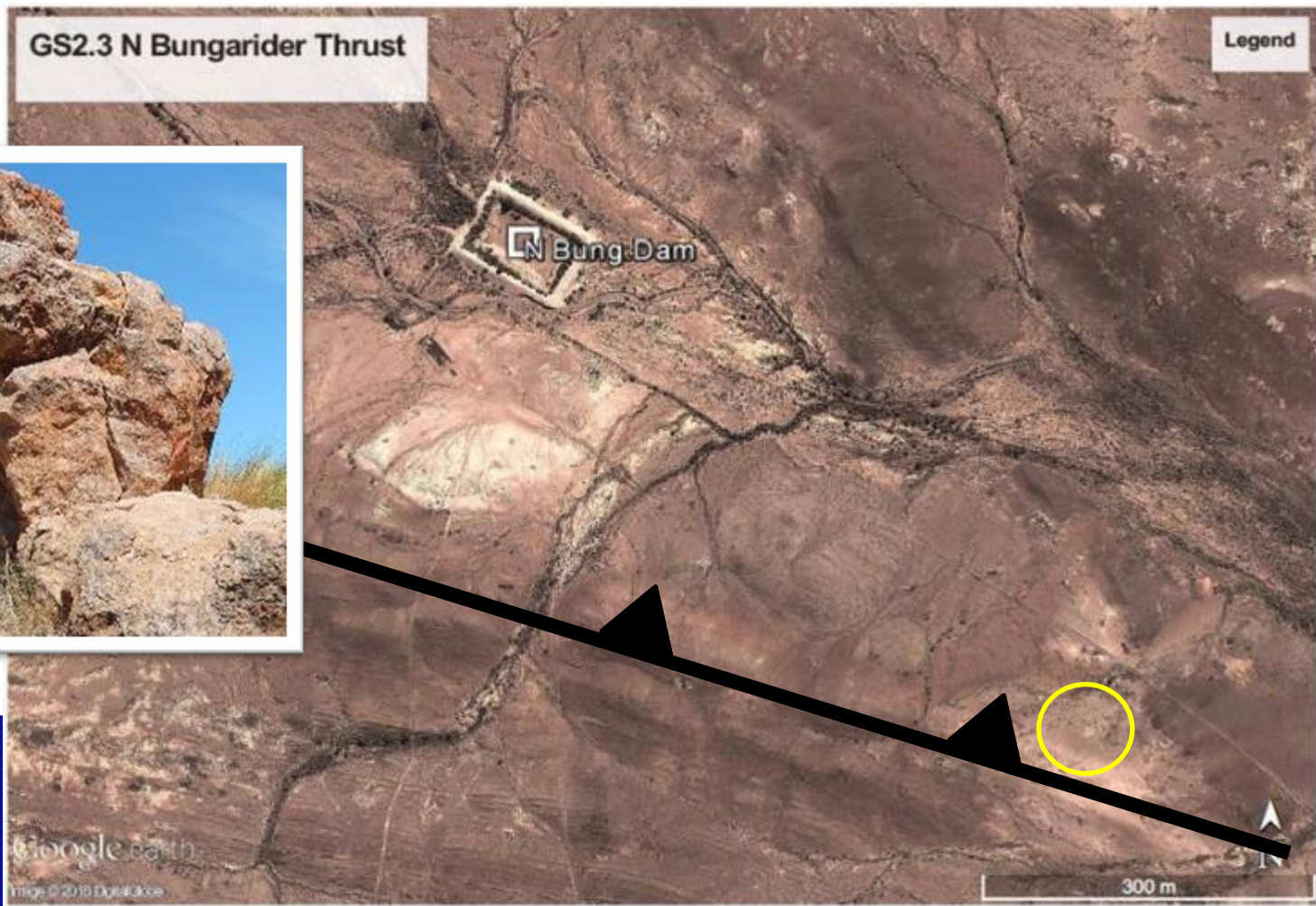


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Geoconservation & Geoheritage

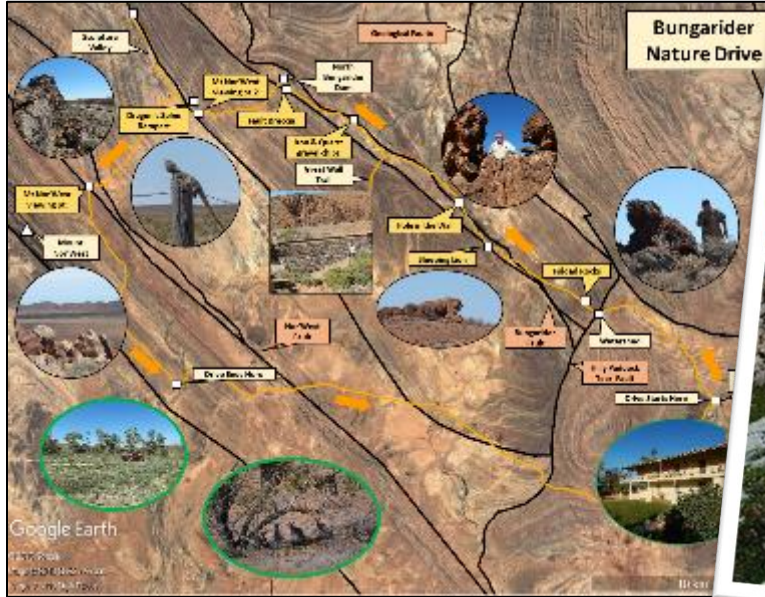
GS2.3 N Bungarider Thrust

Legend



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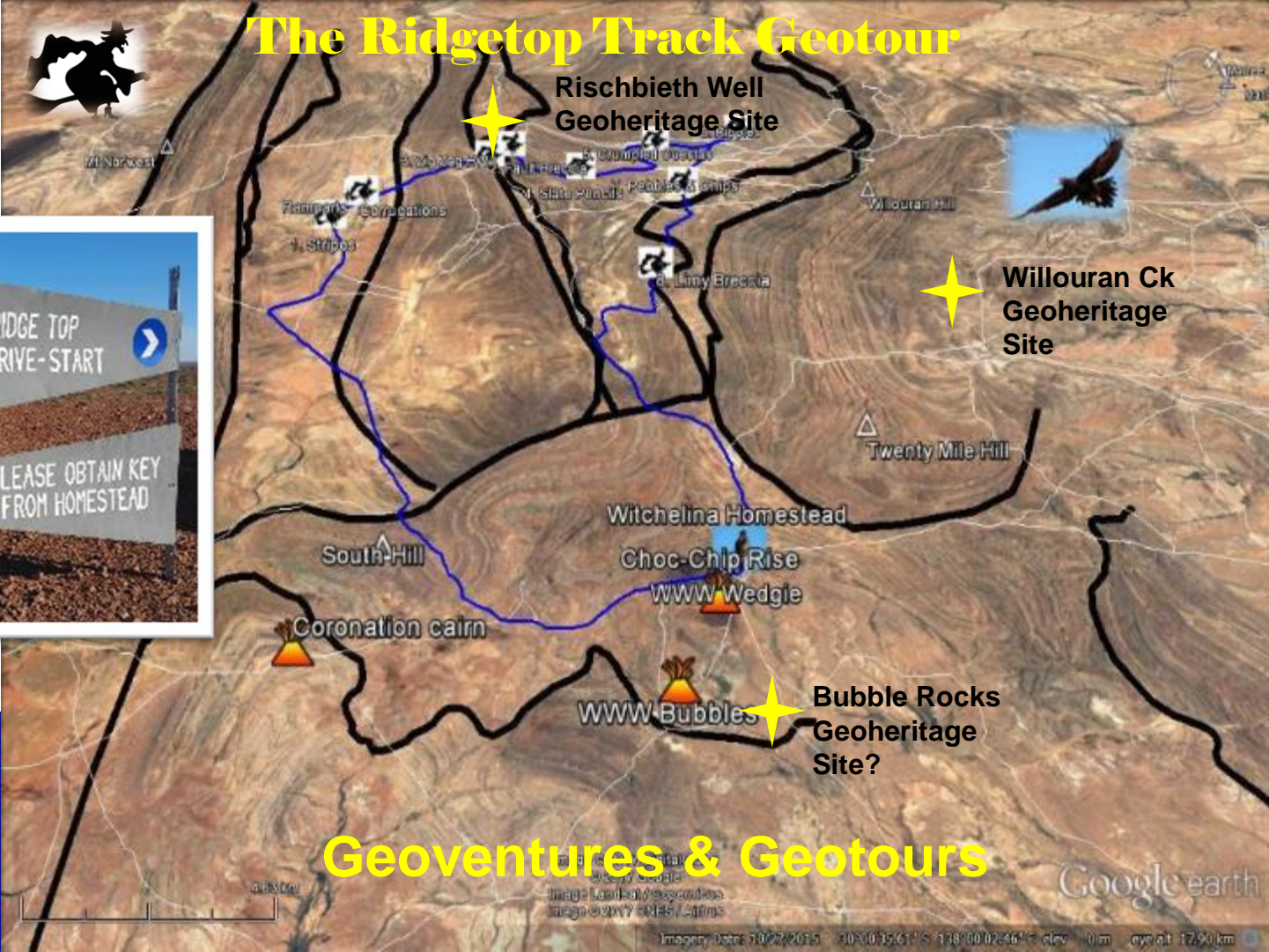
Maps, brochures, signs, guides, trails



**Geoscience
education &
Geotourism**



The Ridgetop Track Geotour



Landscapes & Geosites

The Witchelina Ridgetop drive showcases a landscape 100's of millions of years in the making.

1. Ancient Seas, Ramparts and Ridges. Limestones, sandstones and shales formed here from fine grains of sand and mud that settled slowly to the bottoms of ancient seas. These were buried to form layers then buckled, folded and tilted as great mountain ranges formed 500 million years ago. Erosion that followed left strange natural stripes, subtle corrugations of harder limestones and upstanding ramparts and ridges across the landscape.



2. Breccia – broken rocks. Near the North Bungarider Dam is a white outcrop of quartz 'breccia', Italian for "broken rocks", which follows the line of the Bungarider Fault, where the rock has been ground up by movement along the fault. Balanced rocks and a rock hole also are seen here.

3. Saddles, Gulleys and Zig Zag Folds. The Ridge Top track follows a ridge of hard white quartzite. Stop at the cairn and look north to see curiously regular pattern of saddles and gulleys, as seen on the brochure cover; on the map they show sweeping curved "zig-zag" folds formed during building of the mountain ranges. Look SW across the vastness of the plains landscape to the distant majestic Mount Nor'west



4. Slate 'Pencils'. During mountain building intense pressure and heat on the rocks produces a new slaty cleavage by realigning minerals in the rocks. The rock here has two cleavages at right angles to each other, yellow younger lines and red older lines, that breaks the rock into lengths of slate 'pencils'.

5. Cuestas. This is a Spanish word describing ridges with a gentle slope on one side and a steep slope on the other. These cuestas have a hard quartzite lying over softer dark shale. There are crumples and crinkles in both rock types formed during mountain building.

6. Ancient Ripples. The Mirra Creek flows as a waterfall over a natural quartzite ridge which was enhanced by a stunning rock wall weir. Below the Weir, ripples almost 800 million years old are preserved in sandstone deposited by an ancient river.



7. Pebbles and Chips. The brilliant fields of white "milky" quartz pebbles and chips you can see around you have been washed down from the ridge above during times of heavy rain and flash flooding on the hill slope. They are fairly common on Witchelina because the quartz is very hard and resistant to erosion.

8. The Limy breccia here looks a bit like a coarse concrete. It is a different kind of breccia, with limestone fragments encased in a limestone matrix. It could have formed by flow of salt diapirs moving through this area.

Total distance: Approx. 93 kms round trip allow 6-8 hours or take shortcut

Difficulty: Easy, with 2 moderate sections
Basic signs As you drive, you'll see signs:



- shows the direction to follow for the Ridgetop Nature Drive.



- Geosite of particular geological interest.



Please note: fossicking on Witchelina is prohibited.

- Landscape site/feature where you may wish to stop.

The Ridgetop Nature Drive nature drive is only suitable for 4WD vehicles and is safe to travel only during daylight hours. Please begin your drive before 12 noon. Signs clearly show your route, please do not leave the marked track.



Witchelina Ridgetop Geotrail





Google earth

Image ©2016 Earthstar
Image ©2016 Google Earth
©2016 Google
©2016 Google

10 km



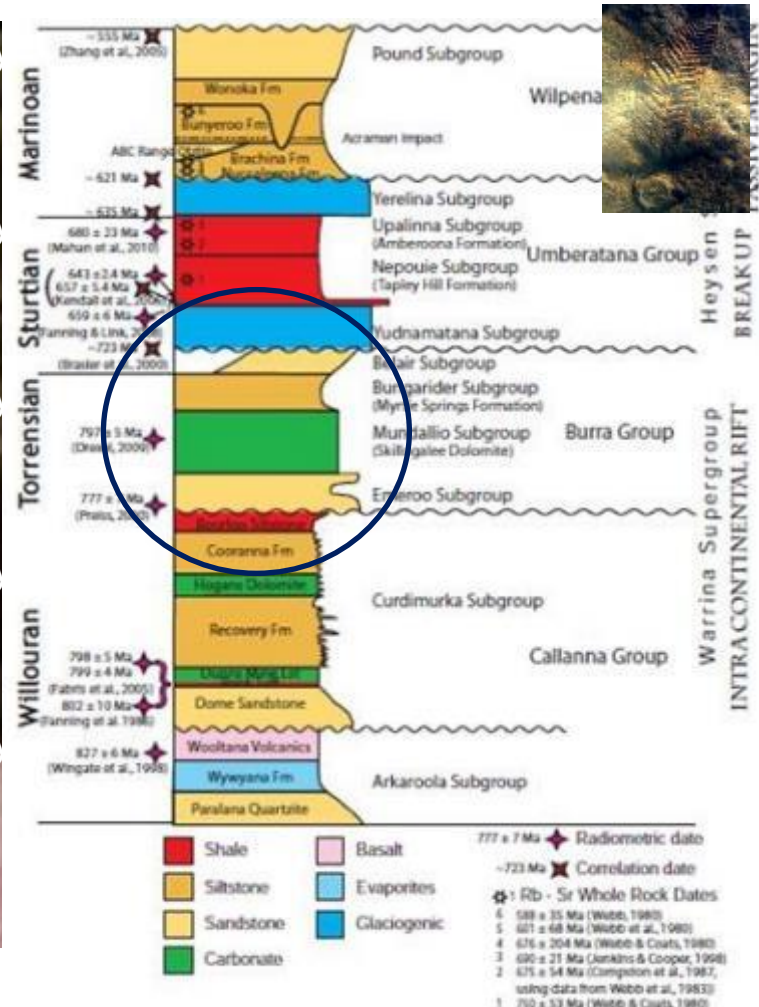
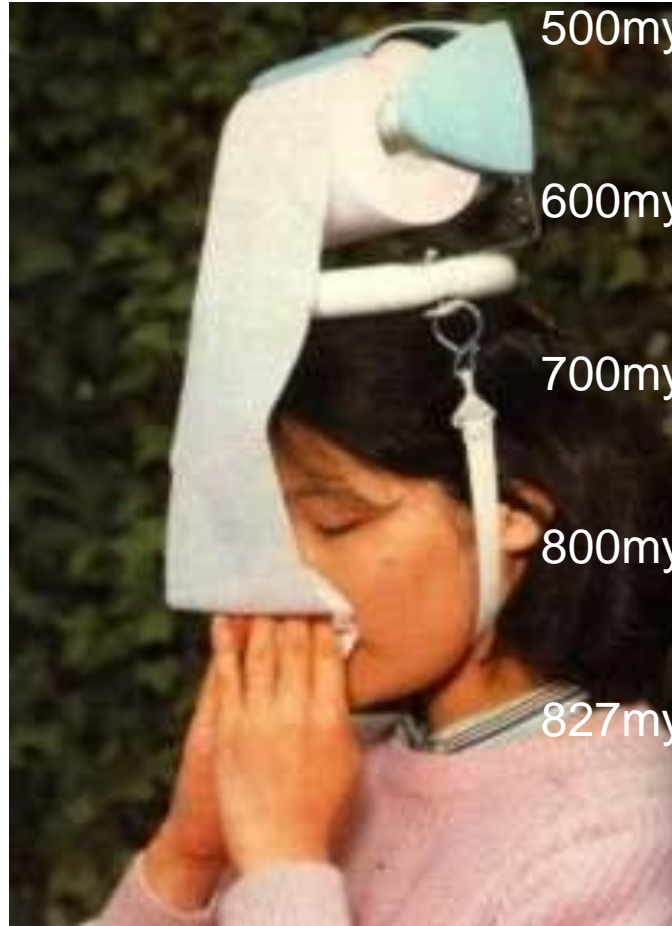
STRIPES



Geosite Interpretation – The Striped Plain



Chrono-Stratigraphy of the NeoProterozoic Willouran Trough



Gs 2.1 Striped Plain

Geosite 1 Google Earth pic.



Google earth

Image © 2010, DigitalGlobe



200 m

Geosite - Drone flyover video





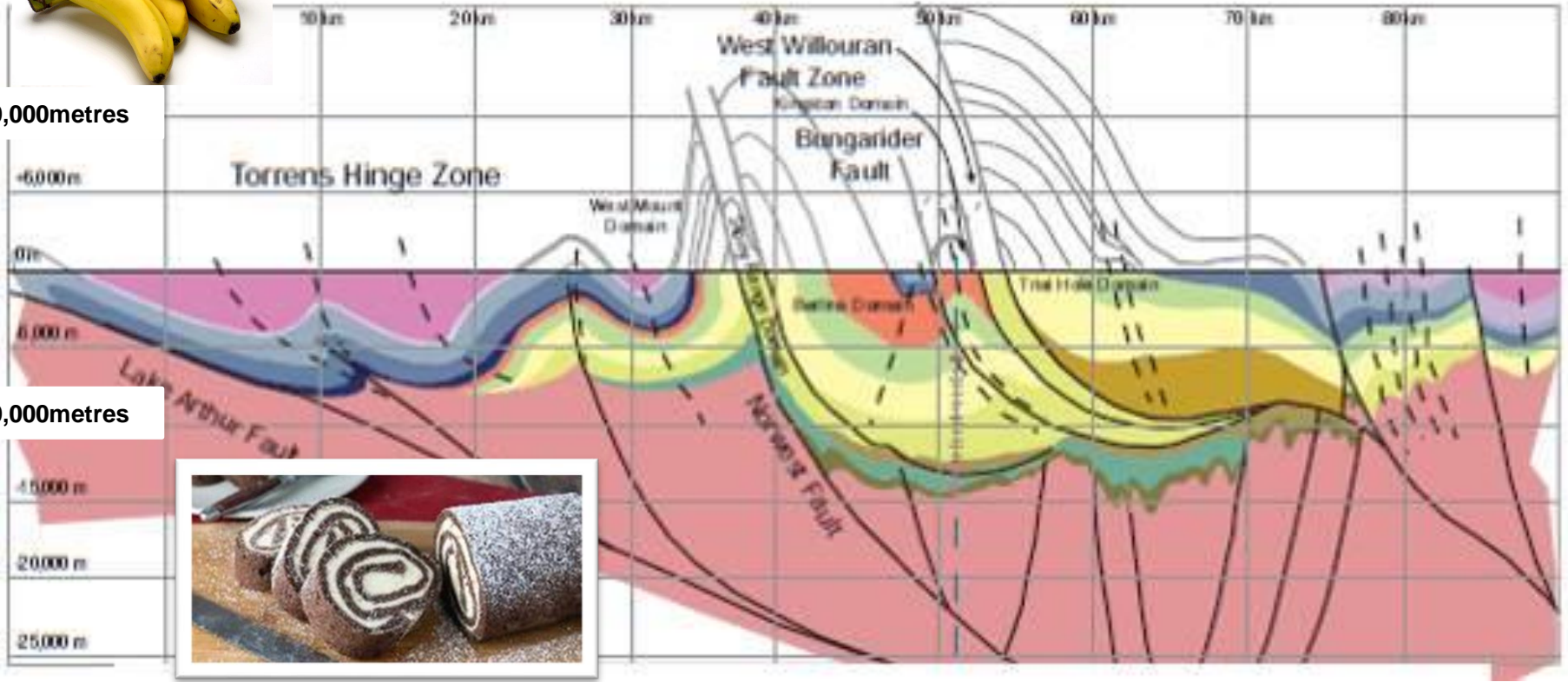
Geosite – “Dragons-back Ramparts”







“Tilted Beds and Deep Rocks”



Geodiversity & Geointerpretation

MacKay, 2011



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**Geotours, Geocommunities &
Geoconferences**

“Networking”



2016-2018 – Nature Foundation SA Witchelina VR Dunes Geotour

<http://projectlive.org.au/index.html>



James PR & Kor M (2018) Virtual reality Downunder - OUTBACK geotourism MAKES IT REAL!

Welcome to "Hotspot Hiltaba"

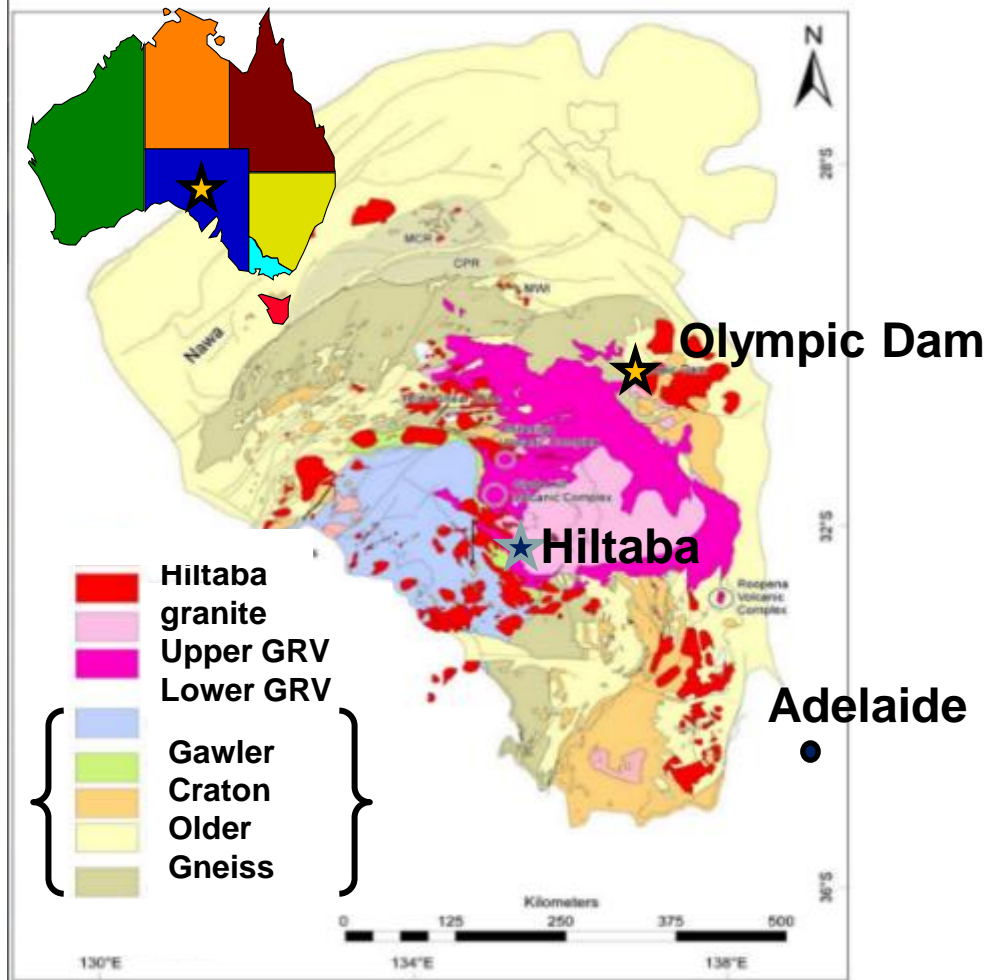


"A Unique Geological Tale"



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Unique ?



1. The Gawler Craton (3000-2000Ma) **Very OLD!**

2. The GRV – **Very BIG!**
(Gawler Range Volcanic)
Event (1590Ma) inc. the Hiltaba
Granite Suite

3. The Acraman Impact (590Ma)
– **Very LOUD!**

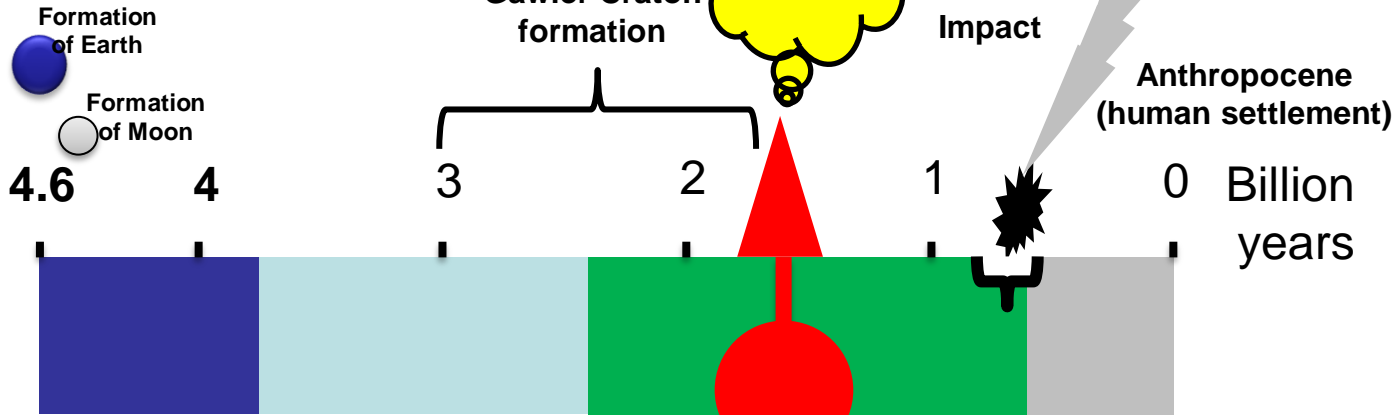
4. Olympic Dam Mine
120m tons CU +Au +U
500yr lifespan – **Very RICH!**

The Northern Eyre Peninsula, South Australia

Deep Earth



Deep Time



Supervolcano At End of Eruption

Steam, Ash,
and Pyroclastic Materials

Crater

Alternating Layers of Lava
and Pyroclastic Material

Vent

<https://youtu.be/C79QekHjH6U>



Cone

Partially Emptied
Magma Chamber

Country Rock



Image Editor

Hiltaba Nature Reserve



**LAKE
ACRAMAN**

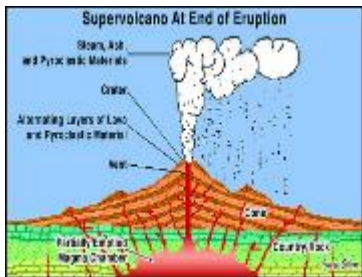
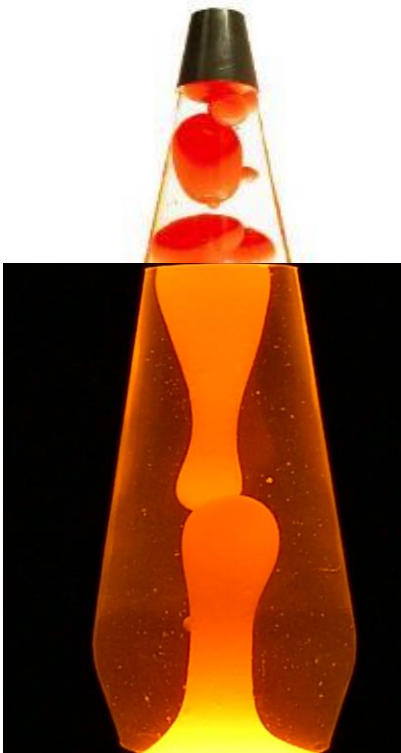
**Hiltaba
Laccolith**
●
**Hiltaba
Homestead**

COVER

**CORRABINNIE
PALAEOCHANNEL**

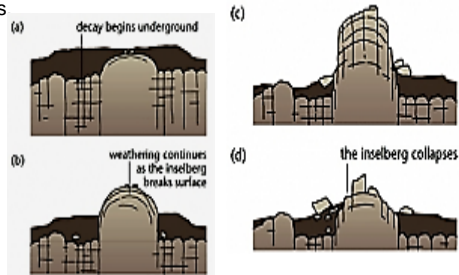
EUCARRO RHYOLITE

**YARDEA
DACITE**



4. The Hiltaba Granites and their landscapes

The subsequent landscape evolution at Hiltaba is strongly influenced by the weathering patterns of the GRV volcanics and especially their accompanying granite intrusions of the Hiltaba suite. The hard basement rocks of the area are largely isolated small hills or ridges with rounded profiles called Inselbergs (German for small/island mountains), which rise out of the alluvial plains



Inselbergs develop over time by gradual weathering of the granite by percolating water, initially when the feature is below the surface. The water within joints (fractures, which can still be seen) helps to chemically rot the rocks, whilst later erosion removes the rotted sandy “grus”, which then forms the gravelly soil debris.

This process also produces rounded boulders (tors), on the tops of hills and some that have rolled down the slopes, plus pillars, pedestals and balanced rocks creating unusual and often intricate natural sculptures. You can look for exfoliation (sheeting) joints which lift large flakes of granite away from the surface; cavernously weathered boulders and hillsides (tafoni) and flared (concave upwards curved) slopes; channels and gutters (rillen) which form by flowing water down the bare slopes after rain; and the rock basins (gnammas) on top of the hills.

You will be amazed by the variety and diversity of rocks, and minerals, landscapes and landforms that occur over the Hiltaba area, all of which reveal the majesty and drama of the Eons of geological time and history that occurred below your feet.

Hiltaba Nature Reserve Nature Drives

Total distances: Approx. 80km round trips
Difficulty: Mostly easy, with

some moderate sections
The Nature Foundation welcomes you to Hiltaba. This is one of our flagship Reserves, and we're proud of the conservation and scientific work that we and our partners do here.

As you drive, you'll see a few basic signs:



shows direction to follow for Nature Drives with different colours for different drives.



indicates a geological feature you may like to stop and inspect. Please note: fossicking on Hiltaba is prohibited.



indicates another feature you may like to stop and inspect.

Introducing Nature Foundation SA

Nature Foundation SA is a not-for-profit nature charity which works to Save, Protect and Restore South Australia's Natural Biodiversity & Geodiversity.

Before you set off

Please ensure you've signed an indemnity form, paid your entry fee, have enough fuel, food and plenty of water.

Your safety is our concern but your responsibility

The Nature Drives are only suitable for 4WD vehicles. Due to uneven terrain, roaming animals, and other factors, the drive is safe to travel only during daylight hours. Please begin your drive on the track before 10 am. Signs clearly show your route, please do not leave the marked track.



Welcome to Hiltaba Rocks and Landscapes



2 PRETTY POINT
CAMPGROUND



MT ST MUNGO
DRIVE-START



PLEASE OBTAIN KEY
FROM HOMESTEAD



Deep Impact



Hidden Valley behind Barry Bore – stacked lava flows











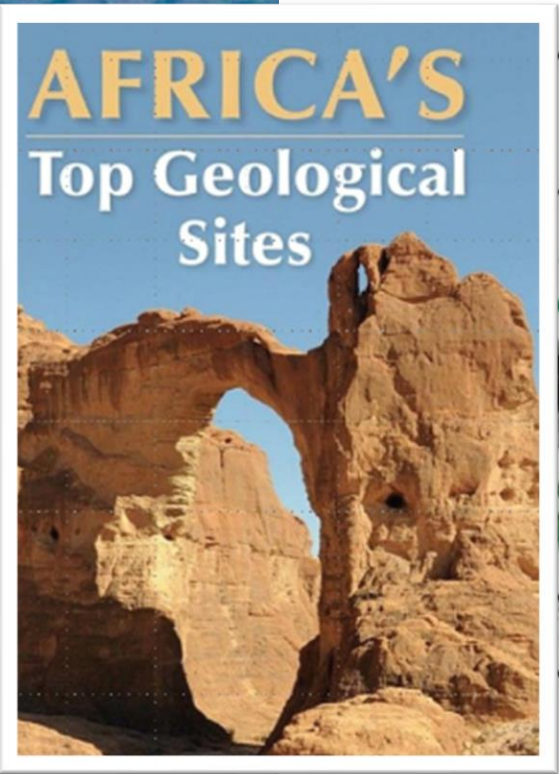
2023 – ?????
Thank you!





Ngorongoro Lengai Geopark

Volcano, Culture and Geoheritage



“Networking”

Azores EGN Sept 2017

“European Geoparks Network”

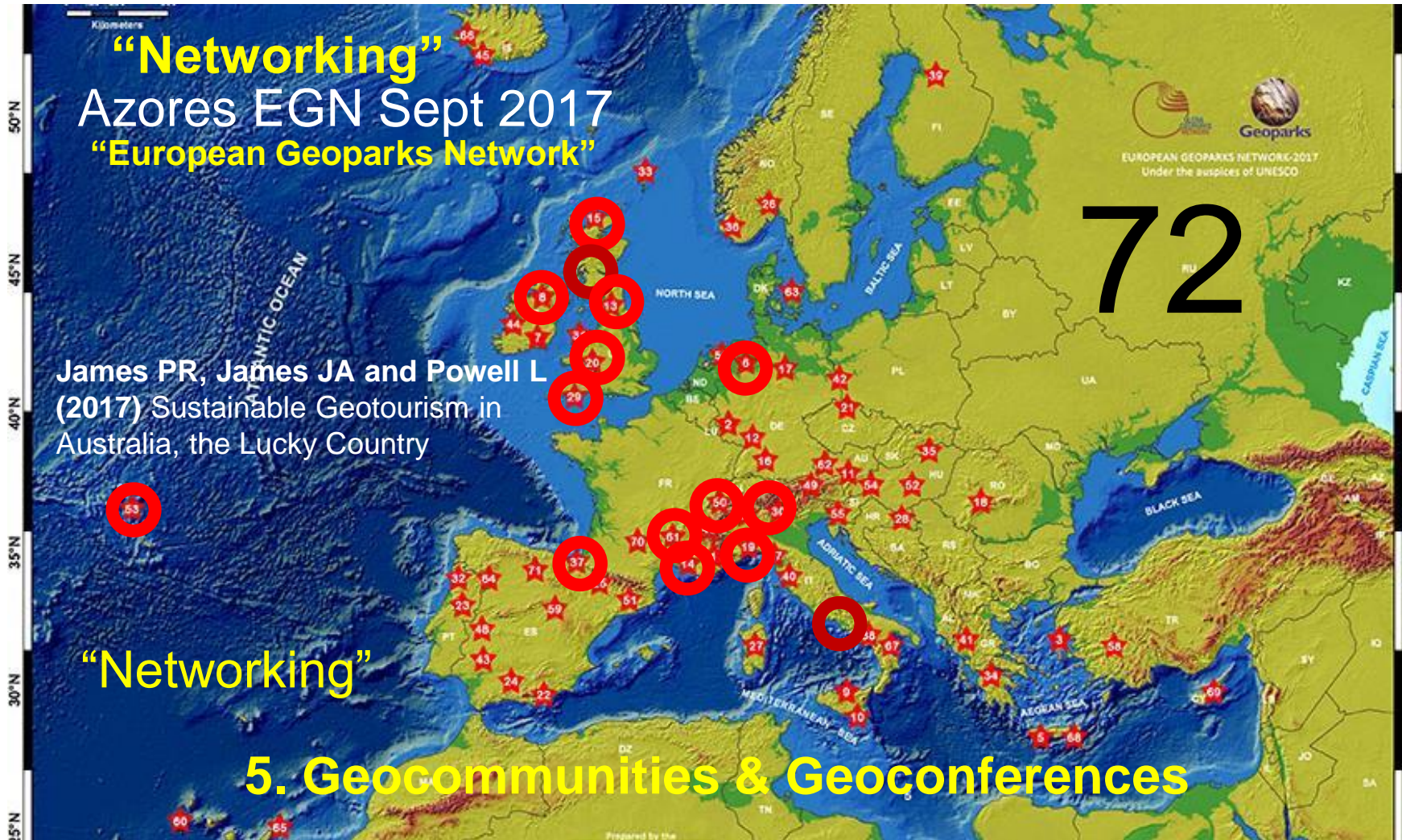


72

James PR, James JA and Powell L
(2017) Sustainable Geotourism in
Australia, the Lucky Country

“Networking”

5. Geocommunities & Geoconferences





Mapping the trails

Sustainable community project involving people that hike regularly in the Geopark.

KOSKAL KOSTALDEKO GEOPARKEA
FLYSCH & KARST EXPERIENCE

FLYSCH

- 1.300 m altitudinal range
- 2000 years of human history
- 50 km² of natural area

KARST

- 1000 m altitudinal range
- 1000 years of human history
- 100 km² of natural area

European Geoparks Network
european-geoparks.org



Geocommunity & Geoconferences
Geoconservation & Geoheritage
Geotourism & Geo(Sci)ed



Azores EGN Sept 2017



Geocommunity & Geoconferences



ADAMELLO BRENTA GEOPARK
Madonna di Campiglio - Italy

8th INTERNATIONAL CONFERENCE ON UNESCO GLOBAL GEOPARKS

8-14 SEPTEMBER 2018



James PR & Kor M (2018) Virtual reality Downunder - OUTBACK geotourism MAKES IT REAL!



2018- 8thUGG Conference, Italian Dolomites



Geocommunity & Geoconferences





- GEO PARK GEOLOGY**
- Limestone
 - Shale
 - Sandstone and Shale
- ROAD NETWORK**
- National Road
 - Regional Road
 - Link Road

USE SUSTAINABLE TRANSPORT

- Bus Service
- Train Station
- Ferry
- Licensed Car Charging Point

GET ON YOUR BIKE

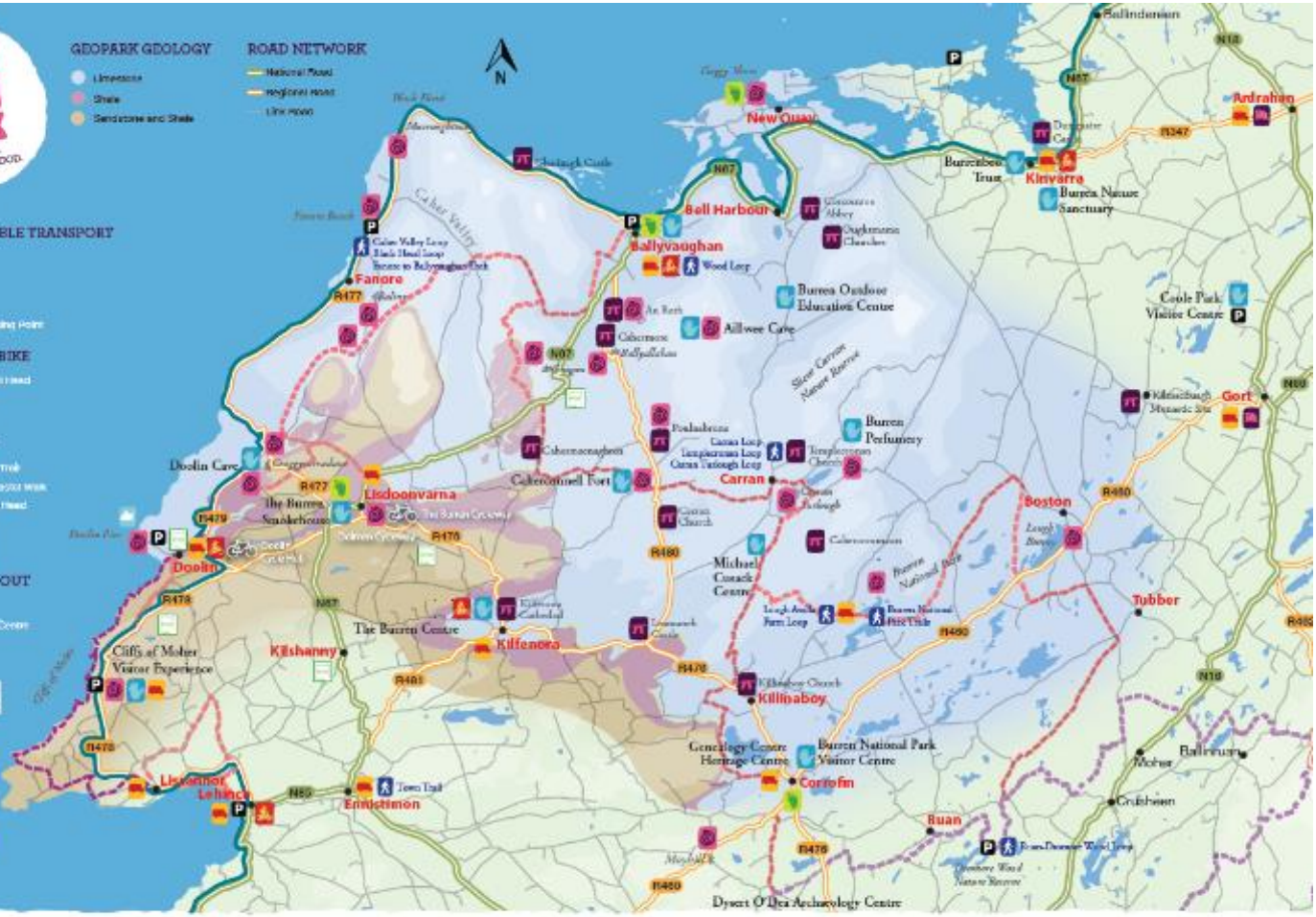
- Cycling Route Trail Head
- Bike Hire Point

TAKE A WALK

- Coastal Heritage Trail
- Cliffs of Moher Coastal Walk
- Looped Walk Trail Head
- Barron Way
- Moss Carrs Way

CHECK THESE OUT

- Secure
- Wildlife/Aviation/Coast
- Mountain
- Viewing Point
- WILD ATLANTIC WAY



Maps



FUNDED BY



SUPPORTED BY



Source of map data:
 Office for National Statistics (ONS) (2015) Ordnance Survey (OS) data.
 Ordnance Survey (OS) (2015) Ordnance Survey (OS) data.
 Ordnance Survey (OS) (2015) Ordnance Survey (OS) data.
 Ordnance Survey (OS) (2015) Ordnance Survey (OS) data.
 Ordnance Survey (OS) (2015) Ordnance Survey (OS) data.

Geofood & T shirts





