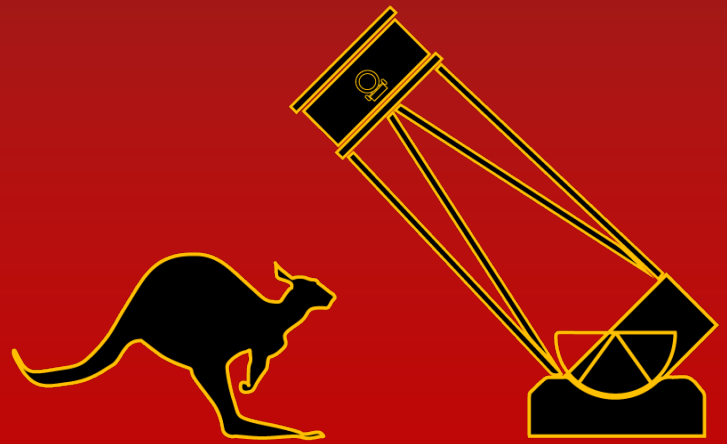
Australian Impact Craters and Meteorites

Tony Buckley



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Australia's Impact Craters

Confirmed Craters

Name	State	Diameter	Age (years)	Coordinates
Acraman	SA	90km	~590 Ma	-32° 01′ 135° 27′
Amelia Creek	NT	20km	600 -1660 Ma	-20° 55′ 134° 50′
Box Hole	NT	170m	5,400 ± 1,500	-22° 37′ 135° 12′
Connolly Basin	WA	9km	< 60 Ma	-23° 32′ 124° 45′
Crawford	SA	8.5km	> 35 Ma	-34° 43′ 139° 02′
Dalgaranga	WA	24m	~3,000	-27° 38′ 117° 17′
Flaxman	SA	10km	> 35 Ma	-34° 37′ 139° 04′
Foelsche	NT	6km	> 545 Ma	-16° 40′ 136° 47′
Glikson	WA	19km	< 508 Ma	-23° 59′ 121° 34′
Goat Paddock	WA	5.1km	< 50 Ma	-18° 20′ 126° 40′
Gosse Bluff	NT	22km	142.5 Ma ± 0.8 Ma	-23° 49′ 132° 19′
Goyder	NT	3km	< 1.4 Ga	-13° 09′ 135° 02′
Henbury	NT	157m	4,200 ± 1,900	-24° 34′ 133° 08′
Hickman	WA	270m	10-100,000	-23° 02′ 119° 40′
Kelly West	NT	10km	> 550 Ma	-19° 56′ 133° 57′

Name	State	Diameter	Age (years)	Coordinates
Lawn Hill	QLD	18km	> 515 Ma	-18° 40′ 138° 39′
Liverpool	NT	1.6km	543 - 1000 Ma	-12° 24′ 134° 03′
Matt Wilson	NT	7.5km	< 1402 Ma ± 440 Ma	-15° 30’ 131° 11’
Mount Toondina	SA	4km	< 110 Ma	-27° 57′ 135° 22′
Piccaninny	WA	7km	< 360 Ma	-17° 26′ 128° 26′
Shoemaker (Teague)	WA	30km	Proterozoic	-25° 52′ 120° 53′
Spider	WA	13km	> 570 Ma	-16° 44′ 126° 05′
Strangways	NT	25km	646 Ma ± 42 Ma	-15° 12′ 133° 35′
Tookoonooka	QLD	55km	128 Ma ± 5 Ma	-27° 07′ 142° 50′
Veevers	WA	80m	< 20,000	-22° 58′ 125° 22′
Wolfe Creek	WA	875m	300,000	-19° 10′ 127° 48′
Woodleigh	WA	60–120km	364 Ma ± 8 Ma	-26° 03′ 114° 40′
Yarrabubba	WA	30km	~2 Ga	-27° 10′ 118° 50′
Ora Banda	WA	5km	100 Ma	-30° 38′ 121° 06′
Yallalie	WA	12km	80-90 Ma	-30° 27′ 115° 46′

Unconfirmed Craters

Name	State	Diameter	Age (years)	Coordinates
Bedout	Indian Ocean, WA	200km	250 Ma	-18° 119°
Darwin Crater	TAS	1.2km	800,000	-42° 19′ 145° 40′
Deniliquin multiple-ring feature	NSW	520km	417-520 Ma, Hirnantian mass extinction event	-35° 32′ 144° 58′
Diamantina River ring feature	QLD	130km	300 Ma	-22° 09’ 141° 54’
East Warburton Basin	SA	200km	~300-360 Ma	-27° 00′ 140° 05′
West Warburton Basin	SA	200km	~300-360 Ma	-26° 34′ 137° 33’
Gnargoo	WA	75km	<300	-24° 48′ 115° 13′

Henbury Meteorite Complex

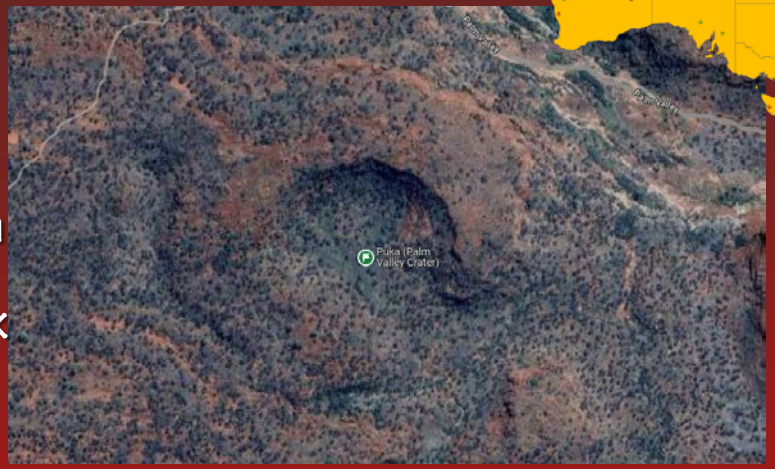
- A group of 13 craters a few hours drive south of Alice Springs
- Impact was about 5,000 years ago
- The biggest crater is 180 metres wide
- Thousands of nickel/iron meteorite fragments have been found in the area

Gosse Bluff Crater (Tnorala)

- Originally 22km wide, Gosse Bluff is now an eroded 3.5 km wide remnant about two hours' drive west of Alice Springs
- Impact was about 142 million years ago
- The central uplift is still visible
- You can drive inside the crater

Palm Valley (Puka) Crater

- In Northern Territory, a couple of hours' drive west of Alice Springs
- ~280 metres diameter, but age is unknown
- An impressive sight, within a moderate walk
- In August 2023, Lachlan visited the site and got the photo below



White Cliffs Crater (suspected)

- In NSW, about 10km (6mi) north-east of White Cliffs
- ~2km diameter, but age is unknown – and crater is not yet confirmed

Wolfe Creek Crater

- In Northern Territory, a couple of hours' driv west of Alice Springs

- ~280 metres diameter, but being about 300,000 years old much of the dish has been filled in by erosion and it is now around 60 metres deep
- Makes a spectacular sight, being a true crater formation rather than an astrobleme
- In July 2022, Lachlan carried a telescope into the centre of the crater and camped there overnight, observing from the floor of the crater – at the exact centre point!!!

Shoemaker (Teague) Crater

- In the southern part of Western Australia.

- The Shoemaker Crater was renamed in memory of Gene Shoemaker who was tragically killed in a car accident on the Tanami Track as he was driving from Alice Springs to the Wolfe Creek Crater in Western Australia.

- 14 miles in diameter

- Age estimates of between 570m years up to 1.6bn years old

- Much of the dish has been heavily affected by weathering and erosion as are all such ancient craters

Goyder Crater

- Arnhem Land, NT, Near Goyder River
- Heavily eroded but identified by shatter cones and shocked quartz
- 9 - 12 km diameter
- Up to 1,325 million years old

Spider Crater

- Near Barnett Roadhouse on Gibb River Road
- Radiating erosion ridges, identified by shatter cones
- 11 x 13 km wide
- 600 - 900 million years old

Goat Paddock Crater

- Kimberley Plateau, WA
- 5.1 km wide with complex central structures
- 55 million years

Box Hole Crater

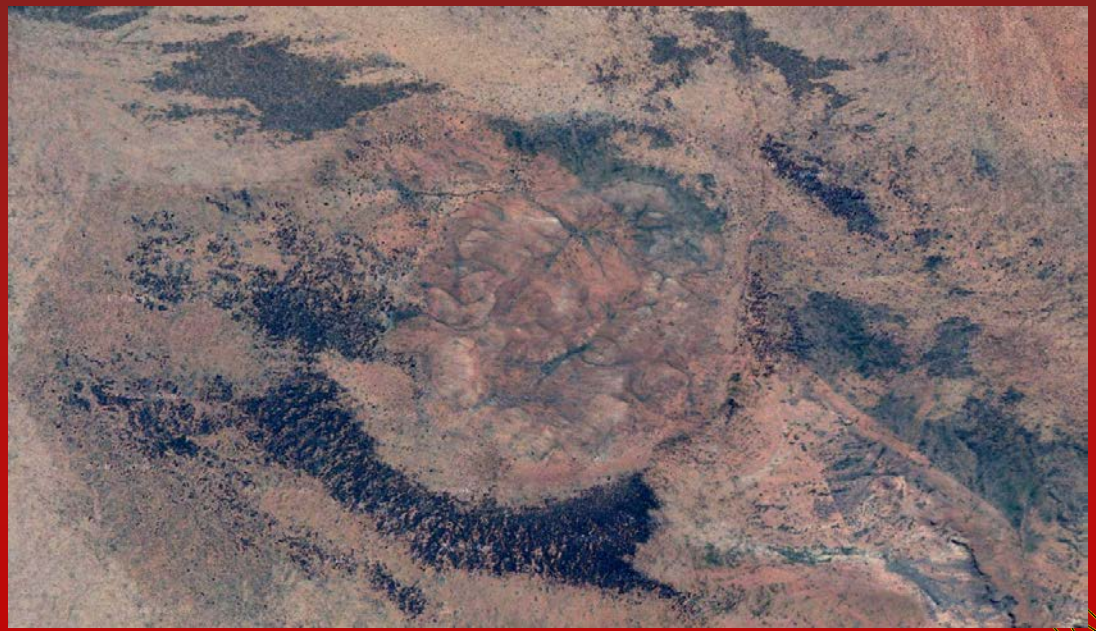
- Northern Territory
- Iron meteor fragments have been found here
- 160 metres wide
- 5,000 years old
- In July 2023, Lachlan brought back a sample which you can see here!!!

Foelsche Crater

- Heavily eroded and partly buried, Near Foelsche River, NT
- Lots of shocked quartz
- 6 km diameter
- Age uncertain ~ 600 million years

Kelly West Crater

- Central NT
- Deeply eroded, with lots of shatter cones
- 6.6km diameter - Central 2km wide uplift of quartzite
- Older than middle Cambrian.

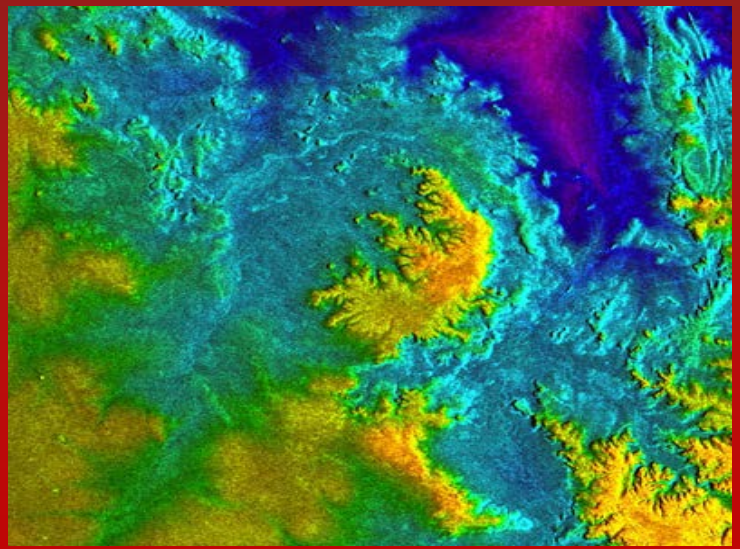


Liverpool Crater

- McArthur Basin, NT
- Heavily eroded with lots of shocked quartz
- 1.5 km diameter
- 543 – 1,000 million years old

Strangways Crater

- Near Strangways River, NT
- Lots of shatter cones and shocked quartz
- 25 km wide
- 646 million years old

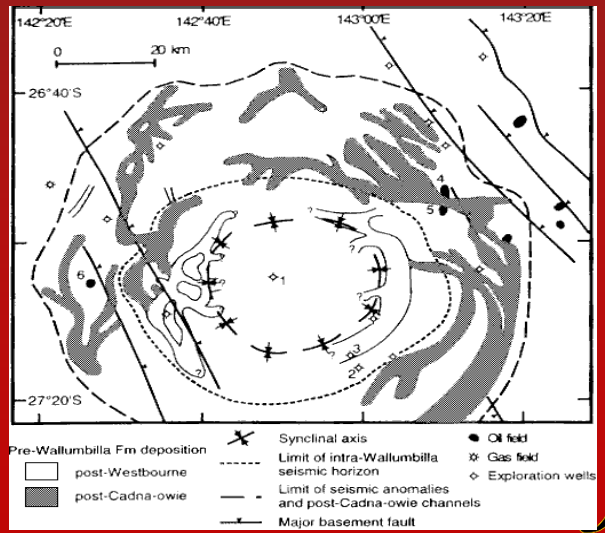


Lawn Hill Crater

- Near Lawn Hill National Park in NW Qld
- Shatter cones, shocked quartz, uplifted rocks
- May have been invaded by the sea after impact
- 18 km wide
- 500 million years

Tookoonooka Crater

- South Western Qld
- Impact breccia, melted glass. Vitrified impact melt glass. Found during oil exploration
- 55 km diameter
- 128 million years

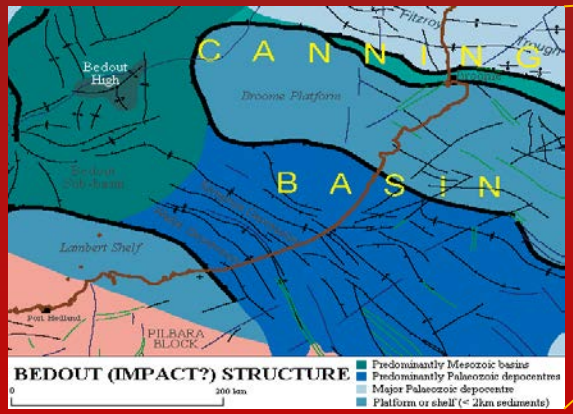


Acraman Crater

- Southern SA
- Ejecta extends for a radius of over 500 km
- Heavily eroded, but clearly outlined on satellite images
- 90 km diameter
- 590 million years old

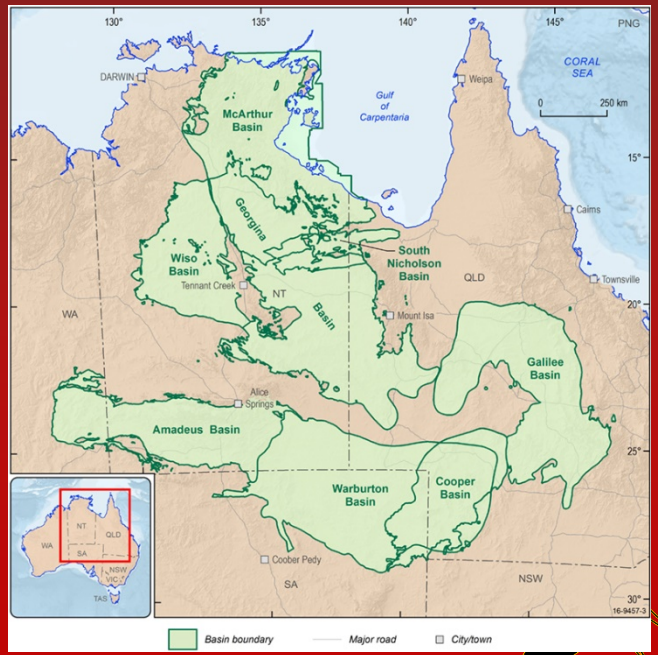
Bedout Impact Structure

- Offshore and undersea, 300 km west of Broome, WA
- Found by oil exploration
- Matches the Great Permian Extinction
- 200 km diameter
- 250 million years old



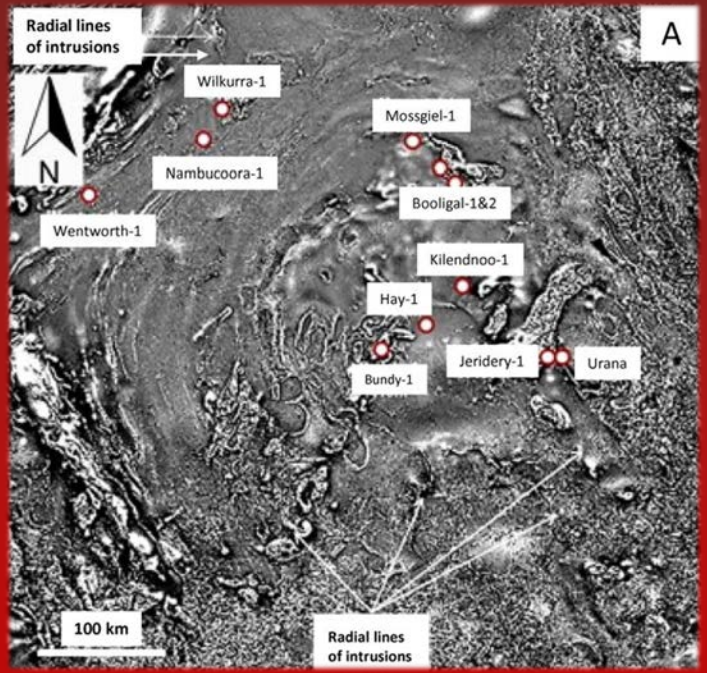
Warburton Basin Craters

- Location: South Australia
- Combined, the East & West Warburton Craters make up the largest known impact zone on Earth, but individually, are smaller than the two biggest known impact craters in the world – The Chicxulub Crater (*150km wide, located under Yucatán Peninsula*) and The Vredefort Structure (*300km wide, in South Africa*)
- ~200+ km diameter / 4km deep
- ~300 – 360 million years old
- Scientists proposed the impact formation through analysis of shocked quartz grains from the area after a circular anomaly appeared in seismic tomography studies of the region



Deniliquin-Booligal Ring Structure

- 32km (20mi) NW of Deniliquin, NSW
- 520km (320mi) diameter and around 20-30km deep
- ~417 – 520 million years old
- This multiple-ring feature is a distinct deeply buried structure with characteristics which suggest association with an asteroid impact structure of 520km (320mi) diameter, making it the larger than the largest previously known one, the Vredefort impact structure in South Africa, of about 300km (190mi) diameter
- The impact that caused this structure may have triggered the massive Ordovician-Silurian extinction event which eliminated about 85% of the planet's species. It was more than double the scale of the Chicxulub impact that killed off the dinosaurs.



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- Dozens of other known and suspected impact sites have been identified, but most are heavily eroded scars, some very large, up to 160 km wide.

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