

# GUIDELINES

No. 167 - AUGUST 2025



## INTO THE BLUE



Three Sisters Opened



Ancient Secrets Revealed



Nullarbor With a Difference

THE MAGAZINE OF THE CAVE DIVERS ASSOCIATION OF AUSTRALIA



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Policy Type: Affinity Combined General & Products Liability Policy - LIU-  
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Insurer: Affinity Insurance Brokers Level 1, 1265 Nepean Highway,  
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Underwritten by Liberty International Underwriters ABN: 61 086 083 605.  
Incorporated in Massachusetts, USA.

Name Insured: Cave Divers Association of Australia Inc. Policy# BL500196.

Public Liability: \$20,000,000 any one claim. Expiry: 30th September 2024.

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FRONT COVER:

Picture: Advanced cave diver Mark Simpson glides through the Blue Lake with the assistance of a scooter as part of a recent scientific expedition under the surface of the renowned site. Picture: MARK SIMPSON

CAVE DIVERS  
ASSOCIATION OF AUSTRALIA

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GUIDELINES is a newsletter of  
the Cave Divers Association of Australia.

All articles for the following issue are to be sent to  
the Guidelines Editor: **guidelinesmagazine@gmail.com**

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Print Post No. PP 100023987



# NATIONAL DIRECTOR'S MID-YEAR UPDATE

**Welcome new members and those upgrading their certifications.**

## WEEBUBBIE CAVE

Whilst Pannikin Plains Cave is now open, Weebubbie Cave is still closed. The initial closure was rumoured to have occurred due to a collapse. A subsequent investigation revealed there was no truth to the rumour. Meanwhile, Department of Planning, Lands and Heritage (DPLH) has handed over Weebubbie Cave to the traditional owners, Mirning Traditional Land Council (MTLAC). Management and access arrangements are currently under review, together with a new site management plan. We expect there will be delays while MTLAC finalises these arrangements. A member update will be posted when we have more information.

## SHIPPING CONTAINER RECORDS STORAGE

In case you missed the Facebook post, a 20-foot shipping container is now located at Tank Cave. The purpose of this container is to stop paying rent for a storage facility containing display gear, old training records and receipts – the majority of which are due to be shredded. It is expected the shipping container will also store rescue equipment.

## GROUND PENETRATING RADAR

Truthing update: Although the organisation has owned the GPR for several years (as a gift purchased), it has remained perplexing as to why it is unable to produce any useful data when applied over known karst terrain to detect water-filled voids. Fast forward, the national committee hosted the GPR supplier MALA and geophysicist Sam Rubino to visit and review the settings used. Long story short, the GPR works well over dry cave features and produced excellent results at the back of The G car park, showing services and other dry voids. However, it had proven to be utterly unusable over water-filled, saturated limestone zones.

A ground TEM unit was tested over the same ground near Tank Cave and we are currently awaiting the results. However, it is unfortunate that we still have a GPR asset, which costs us insurance each year but is not suitable for our purposes. We are told there is a market for the GPR, but it seems there is little point in our continuing to own it. According to the constitution, the national committee requires the membership to vote when divesting an asset valued at more than \$10,000. Stay tuned for more information by way of a voting request to divest ourselves of the GPR and hopefully reinvest in a device that may better suit our needs.

## BE AWARE OF YOUR SITE ACCESS OBLIGATIONS

Recently, two members have had their memberships suspended for several years. On both occasions, the land manager had issued complaints directly to the national committee. The land manager made their intentions loud and very clear - ongoing site access was under threat to two very popular sites. The seriousness of these matters was such that they were elevated to the board and the chief executive level of Department for Environment and Water/Forestry. No-doubt access is a privilege available to all members, provided access regulations are complied with.



**Grant Pearce**  
CDAA #1382  
National Director

## SAVE THE DATE

### 2025 CAVE DIVERS ASSOCIATION OF AUSTRALIA SYMPOSIUM AND ANNUAL GENERAL MEETING

Riddoch Arts and Cultural Centre,  
Mount Gambier

November 1, 2025 - Melbourne Cup Day Weekend



# PUBLICATIONS AND RECORDS DIRECTOR'S MID-YEAR UPDATE

The first half of the year has flown by and has seen a number of improvements to the way our members and other stakeholders interact with us. These include improvements to Guidelines, our website usability and our links to social media.

## WEBSITE

We've made changes to our landing page with the introduction of two new widgets: one for Guidelines and the other for the ARC Project. This gives members the opportunity to access the latest on both with the click of a button, rather than using a dropdown menu. We've done the same with a temporary widget for the latest information on the 2024 AGM/Symposium which will be repeated with this year's event in November. In addition, the Hall of Fame page has been updated to include all inductees and to list them in chronological order. Overall, our website traffic has remained stable at around 17,000 page views a month since July 2024.

## LINKEDIN

We've revived our LinkedIn page to give members the opportunity to list their CDAA membership on their professional profiles. In the past listing the CDAA on your profile didn't link back to an official LinkedIn page and logo. It does now, meaning the CDAA logo is displayed on your profile.

## FACEBOOK

Our Facebook page attracted around 4000 visitors per month since the beginning of the year. They were predominantly from Australia followed by the United States, United Kingdom, New Zealand and Thailand. Our follower count was just over 3000 and increasing steadily.

## GUIDELINES

I'm happy to report that our first ever PDF flip-file format for Guidelines (Dec 2024) has been well received by all accounts. However, the paper edition is still ever popular and will continue alongside the electronic format. In addition, our first edition with Jason Wallace as editor also made a positive impression all round. The new layout and approach are fresh and steer Guidelines into a new and exciting direction without compromising tradition and all that we hold dear.

## CONTRIBUTIONS

We have also seen a surge in contributions for Guidelines, which is testament to the success of our new format and design. Thank you for all your stories and photographs and please keep them coming. **Send all contributions to Jason at [guidelinesmagazine@gmail.com](mailto:guidelinesmagazine@gmail.com)**



**Leon Rademeyer**

CDAA #5013  
Publications and Records  
Director



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# BUSINESS DIRECTOR'S MID-YEAR UPDATE

**First off, a big hello and welcome to all our new members, we are very glad to have you along to enjoy the caves that we all find so enticing. It has been a busy start to the year as I find my feet in the business director position and I want to thank all members and directors who have given their support and guidance. The CDAA is run entirely by volunteers and I want to recognise and thank all the people outside the national committee whose services are invaluable and largely invisible to the wider membership. These jobs are often time consuming and take away from hours spent with family, friends and doing the actual diving they joined up for. So, thank you, we could not do any of this without you.**

As we come into the second half of the year, we are busy with preparations for the AGM in November so a special shout out to Aren Leishman and Stephen Fordyce for all their effort to organise this event. We look forward to seeing you all there. We are also busy trying to bring back merchandise, so bear with us while Farzad leads the way on this effort and stay tuned.

More business-related, we are currently looking at our finances and ways to ensure that we can run the association as effectively as possible while covering the costs of insurance and maintaining the sites we provide access too. We try hard to keep all diver-related costs as low as possible, but some changes may need to be made in the future to ensure we have the finances to at least break even on a yearly basis.

Lastly, please remember we are here to help you and help keep diving safe for all and provide access to as many dive sites as possible. If you have any concerns or thoughts, please reach out to us and we will do our best to help you.



**Martin Slater**

CDAA #5061  
Business Director

## STANDARDS DIRECTOR'S MID-YEAR UPDATE

**A quick snapshot of the last six months reveals that the instructor body has been training divers at a rate on par with the last three years. To date we have trained 59 divers across our three levels. Of those 33 are new members entering at Basic Cave level and 26 upgrading to either Cave or Advanced Cave level.**

I would also like to welcome Guilherme Yuquelson Barbosa aka Cajú as our newest instructor. He currently lives in New South Wales and did most of his cave diving and instructing in his native country of Brazil. He has also cave dived in Florida and Indonesia. Cajú will also be giving a presentation at this year's annual general meeting symposium so please come along, say hello and be prepared to be entertained.

Congratulations also to Damian Bishop and Alex Lee who have recently completed their internships and upgraded to Cave instructors. Well done.

Recently Dr Richard "Harry" Harris reluctantly advised his intention to step down from his role as SAR Officer. His ever-growing workload has prevented him from being able to fulfil the role to his satisfaction and he feels that it is time to hand the role over to someone fresh. His part in developing the SROP course and the formal arrangement we now have with SAPOL cannot be underestimated. The energy and effort that Harry has put into this over the years is greatly appreciated and we completely understand his wish to step aside.

We are encouraging any member who feels that 



they have the desire and the skill set to take on this role to please email myself (standards@cavedivers.com.au) with an expression of interest. In the meantime, I will act as caretaker in the position until we can fill it with the right individual.

Having said that, the SROP course will once again be running on the Sunday and Monday of the AGM weekend. I will shortly be in touch with all those who have already expressed interest in participating and I am also pleased to say that the online theory for this program is almost complete so we will have a little more workshop and hands-on time than in the past.

And no report of mine should go unfinished without once again thanking our Records Officer, Andrew 'Otto' Ottanelli, for keeping up to date with renewals and student processing. Thanks for reading and thanks for keeping safe.



**Chris Edwards**

CDA #2247

Standards director

## SITE DIRECTOR'S MID-YEAR UPDATE

**Well time is flying with the middle of the year already and it sure has become cold above ground, but we are starting to see a bit of greenery about with recent rain. We could do with a lot more to get those water tables up in our caves. (Editor's note: Glad to see a lot more rain continue in the region since this report was submitted mid-June).**

It's great to have Three Sisters cave finally open again after quite a few years of work in getting it reopened. I hope you are enjoying the diving experience there.

Pannikin Plains has also been reopened this year with many thanks to the divers who went out to assess the situation and find out what was necessary to achieve access.

Weebubbie still remains closed, but we have done the groundwork and are just waiting on approval from the Mirning Traditional Land Council.

Picanninnie Ponds is still closed and will be for some time I imagine, while Ewens Ponds, at the time of this report, remained closed again.

Pines Cave is now back open after a short closure period due to a member's breaching of rules and regulations and ForestrySA was quite disappointed with the diver's actions. We

spent considerable time working closely with ForestrySA to address their concerns and get Pines reopened again as quickly as possible. Some ForestrySA controlled sites may be closed at the moment due to logging the area and bookings will reopen when finished.

Meanwhile, ongoing discussions continue with Ela Elap landowners to gain access.

We are also trying to get Earls Cave opened and currently renewing the diving agreement with the Little Blue, Allendale East and Sisters sinkholes landowner.

I took a drive around a few sites a few weekends ago and visited some landowners for a chat.

That including calling into Tank Cave to get the details of the defib unit, ready for its maintenance check and chatted to a few divers there in the sunshine – it was a great day for it!

Thank you to all the booking officers for your dedication to getting the divers into the water.

Safe diving!



**Kelvyn Ball**

CDA #3276

Site Director





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A diver in full gear, including a large camera, is underwater in clear blue water, swimming towards a rocky, algae-covered structure.

## BLUE LAKE SCIENTIFIC EXPEDITION

A team of seven CDAA divers had the privilege of diving in the Blue Lake in February this year. However, it was not just a pleasure cruise around the renowned Mount Gambier water body, but followed extensive discussions with SA Water and aimed to build on the scientific knowledge of this vital water source. In this article, hydrogeologist and CDAA Science Officer IAN D LEWIS (CDAA #258) explains the science behind the expedition, discoveries made and hopes for further dive-based research at the site.



The dive team of Grant Pearce, Ian Lewis, Mark Simpson, Adrian Richards, Jon Shaw, John Dalla-Zuanna, SA Water supervisor Maree Shepherd and Richard Harris. Picture: Dave Hurst

### HOW LUCKY IS THE LIMESTONE COAST?

The Limestone Coast is one of Australia's most blessed regions for quality and access to the best freshwater in the continent and it is a privilege that we have access to its water-filled caves and sinkholes. Extensive limestone plains with vast aquifers are rare across the planet – us, the Yucatan and Florida. The Nullarbor is bigger than all the others combined but as we know, its vast groundwater supply is brackish and only suitable for hardy bush cattle and desalination.

### THE TWO GREAT AQUIFERS OF THE LIMESTONE COAST REGION

The big secret of the Limestone Coast region is the groundwater beneath it. This is contained in two vast horizontal sedimentary aquifers – the Gambier Limestone Aquifer and the Dilwyn Sandstone/gravel Aquifer. There is a lot of water in the Gambier Limestone aquifer but far more in the Dilwyn. A thin sealing layer of limey clay called Marl is the “plug” between both aquifers so there is almost no groundwater leakage between them.



The Gambier Limestone aquifer is exposed to the air and forms the regions' land surface – it receives rainfall which soaks directly into it, plus some runoff via several creeks, wetlands and lagoons in the central and northern regions. This is why hydrogeologists call it “unconfined”. This freshwater intake is the agent which dissolves the limestone forming its caves and sinkholes. It is not under pressure and has an average temperature of ~15 degrees C. It is used for farming, irrigation, forestry, bore water supplies and drinking water in large quantities ... and for all our cave diving!

The Dilwyn Aquifer contains no limestone and is not soluble within – it stores groundwater within the pore-spaces between the extensive sand and gravel grains in its sediments. The Marl caps it and separates it from the limestone layer above it, so the Dilwyn aquifer is called “confined” and its water is under artesian pressure. This is seen in upflowing bores specifically drilled within the Dilwyn aquifer that have an average water temperature of 23 degrees C. If only we could dive there in water of that temperature! With only a few special industrial exceptions, the Dilwyn aquifer is only accessed for town water supply purposes and its vast storage of freshwater is kept in reserve by SA Water for future centuries if ever needed.

## THE IMPACT OF THE VOLCANICS

Something huge occurred in the Limestone Coast region to dramatically disturb the separation of the Gambier and Dilwyn aquifers and to break the Marl seal. A series of volcanoes erupted along the Mount Burr Range and in the Glencoe region, beginning maybe as far back as half-a-million years ago. The eruptions occurred up along the Tartwaup Fault zone, which already contained the caves we know along that zone today – Tantanoola, Fossil, Tank, Pines, Nettlebed, Stinging Nettle, Morgans, Iddlebidy, Considines Cave, etcetera, as well as the big caves and sinkholes found throughout the (now) city of Mount Gambier. Then much more recently, ~5000 years ago came the second volcanic sequence – the major 12-eruption events of the Mount Gambier volcano complex culminating in the mega-double-crater of the Blue Lake.

## TWO SOURCES OF GROUND WATER FOR THE BLUE LAKE

The sheer power of the Blue Lake eruptions blasted up through the great thickness of the Dilwyn Aquifer, the Marl seal and the Limestone above, creating a huge breach between the two major regional aquifers. This means that the water feeding into the Blue Lake Crater comes from both aquifers – from the Dilwyn aquifer up into the Blue Lake under artesian pressure and mixing with the unconfined Gambier Limestone aquifer seeping in through the walls of the crater.

## SHAPE OF THE BLUE LAKE BELOW WATER

Many people think that the Blue Lake is a water-filled volcanic pit of lava from the deep. But it's not! The 20m-high limestone walls all around the lake have been revealed by diving to extend fairly vertically below water to a depth of ~70m. There, soundings, sampling and diver observations reveal that the floor of the lake is soft white limestone sediment of as yet unknown depth above the throat of the volcano. There is a 2-3m high slanting ridge running right across the lake floor in a NW-SE direction which volcanologists interpret as an overlap edge of two huge separate eruption craters. However, Grant Pearce and I are of the opinion that it is a step of the Tartwaup Fault itself as it's fairly straight across the middle of the lake, not curved like a crater rim, and it is limestone, not basalt (lava).

## FRACTURE PATHWAYS FOR 'MICRO-FLOWS' OF GROUNDWATER INTO THE LAKE

Groundwater can move more easily through fractures than solid limestone. The unconfined Limestone groundwater seeps from the north (inland) through hundreds of vertical, horizontal and oblique cracks along the Tartwaup Fault zone beneath the city and via Englebrechts Cave and (the unfortunately gunky) Cave Gardens sinkhole. It moves steadily towards the Blue Lake, most likely in the form of multiple micro-flows through the crater walls. (Cave divers are the only people who have already detected



some of these micro-flows during the course of our general dives and exploration – such as in Piccaninnie Ponds, Englebrechts, Tank, Pines and Iddlebidy caves. We are important contributors to the understanding of regional groundwater science.)



Identified fractures descending below the lake surface.  
Picture: Ockert Le Roux

## THE PROBLEM OF GROUND WATER POLLUTION BENEATH THE CITY

A critical factor is the potential for pollution from the city into the lake via the groundwater. Right across the city are several hundred drainage bores each drilled ~90m deep into the Gambier Limestone aquifer to drain away stormwater from the streets so it can be absorbed by the porous limestone. The Cave Gardens waterfalls and the northern inner edge of Englebrechts Cave also take street runoff, as do other unnamed depressions throughout the city. Thus any street oils, fuel chemicals or other impurities can be drained into the limestone aquifer. This drainage practice has been operational since the 1950s and relies on the limestone actually absorbing the impurities within the rock mass itself, not left in the groundwater heading to the lake.

## EFFORTS AT WATER QUALITY PROTECTION

Water quality testing of the lake is continuous and there is a chlorination/fluoridation process applied to lake water on its way up to the city's storage tanks up on the mountain. After 75 years since the multi-drainage bore system commenced, evidence of any city-derived pollutants in the groundwater appearing in the Blue Lake has not yet been detected, fortunately. This means that the limestone under the city has absorbed all impurities, or the southwards-moving groundwater is slow enough not to have travelled to the underwater cliff edges of the lake yet.

## MY INVESTIGATION PROPOSAL FOR DIVING IN THE BLUE LAKE FOR FEBRUARY 2025

Over recent years, I proposed to SA Water to run a scientific examination of the underwater cliffs along the north side of the lake. This was to specifically detect, mark and observe any significant fractures within those walls underwater, in order to identify any possible ingress points for under-city groundwater entering the lake. If such occurrences can be detected and accurately located, sensors and sampling could be permanently installed to monitor incoming pollution and activate an early warning system.

## SA WATER, PERMISSION AND PREVIOUS INVESTIGATIONS

Permission to dive in a public water supply in South Australia (including the Blue Lake) is extremely rare. CDAA life member Peter Horne organised several dive explorations of the Blue Lake in the 1980s and a later one with Grant Pearce in 2008 which recorded water temperature profiles, visibility variations, observed wall biology and geology sites and obtained some silt sample analyses. After a 17-year break and five years of careful and discreet negotiations, SA Water granted me permission to run a series of scientific dives over one week in February 2025. I managed the scientific



dive program while Richard “Harry” Harris ran and coordinated the diving operations and documentary filming.

## SETTING UP AND PLANNING

Once permission had been given, in late 2024 I ran several surface trips in the SA Water dinghy to identify seven prominent fractures in the cliff walls above the lakes that continued down under the water. We pegged them with floats and fixed seven vertical white droplines for divers to examine if the fractures continue below the lake surface and reveal any indications of incoming groundwater micro-flow spots to be tagged by an air dive team of three. A deep team of five conducted examinations and filming of the wider lake walls and the floor where suitable, including collecting silt samples from the 70m centre of the lake. SA Water allowed us to use scooters, which proved excellent in order to cover the long distances across or around the lake to the various work sites that we targeted.



Ian repositioning one of the fracture droplines above the cliff wall at a depth of approximately 20 metres. Picture: Mark Simpson

## THE DIVE TEAM

Harry, Grant Peace, John Dalla-Zuanna and myself formed the core of the team as we had previously dived in the lake, which was necessary for SA Water to have confidence in our capabilities, experience and knowledge of the site. Adrian Richards, Mark Simpson, Dave Hurst and Jon Shaw, though new to the lake, provided a full contribution as science observers, cameramen, buddies and boat operators for Harry’s documentary work, which was partly for SA Water to use in a forthcoming training and public release.



The gantry and pontoon showing the remotely-operated gear trolley, which assisted in delivering gear to the lake surface. Picture: Mark Simpson

## RESULTS SO FAR

### Droplines and Micro-flows

The seven droplines need more accurate positioning underwater as some fractures did not continue downwards or changed angles, which will require re-pegging of some lines. We examined one site which showed a possible microcurrent, but that may have been a result of diver movement in the water column near the site. It needs to be revisited but it does give an indication of the nature of other sites we need to carefully search for.

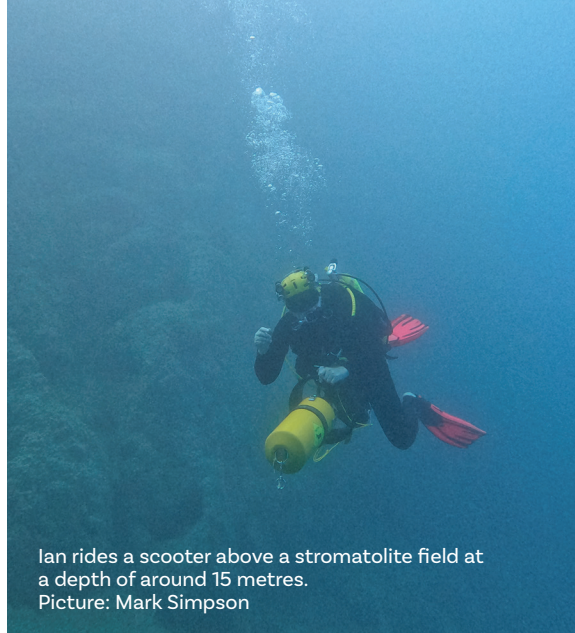
### Wall Mapping

I am assembling a series of geological diagrams which show that the cliff shapes vary quite markedly from the concept we had that they were all near-vertical. These variations indicate post-eruption crater wall structure, different sub-unit layers within the limestone, wall slips and erosion processes (principally by historical rain intensity). ➔





A sloping segment of the upper lake wall in the northwestern sector at a depth of around 8-12m.  
Picture: Mark Simpson



Ian rides a scooter above a stromatolite field at a depth of around 15 metres.  
Picture: Mark Simpson



Grant collecting a silt sample at the bottom of the centre of the lake - note the yabbies at 70m depth. Picture: Richard Harris

## **Sediments**

We are awaiting the assay of the silt sample from the bottom of the lake, but similar samples recovered on the previous diver investigation in 2008 were reported by CSIRO to show elevated content of carbon microparticles over around 150 years, evidence of increased bushfire activity since European settlement and land clearing began.

## **Stromatolites**

If you look from the eastern lookout or have a good pair of binoculars, you can see the seven evenly-spaced white floats along the base of the northern wall. In one of the small

northwestern “bays”, three red floats show the extent of a large stromatolite field. These stromatolites range from 2-6m in height and/or diameter but are large and lumpy, not at all like the elongated pointy stromatolite forests we find in the walls of most sinkholes. They would have begun growing after the eruption ended and the huge crater slowly filled from both aquifers, which would make the stromatolites around 4000 years old or younger.

## **Filming**

Documentary filming is being compiled for SA Water and scientific purposes and will be made available for viewing when completed and can be released.

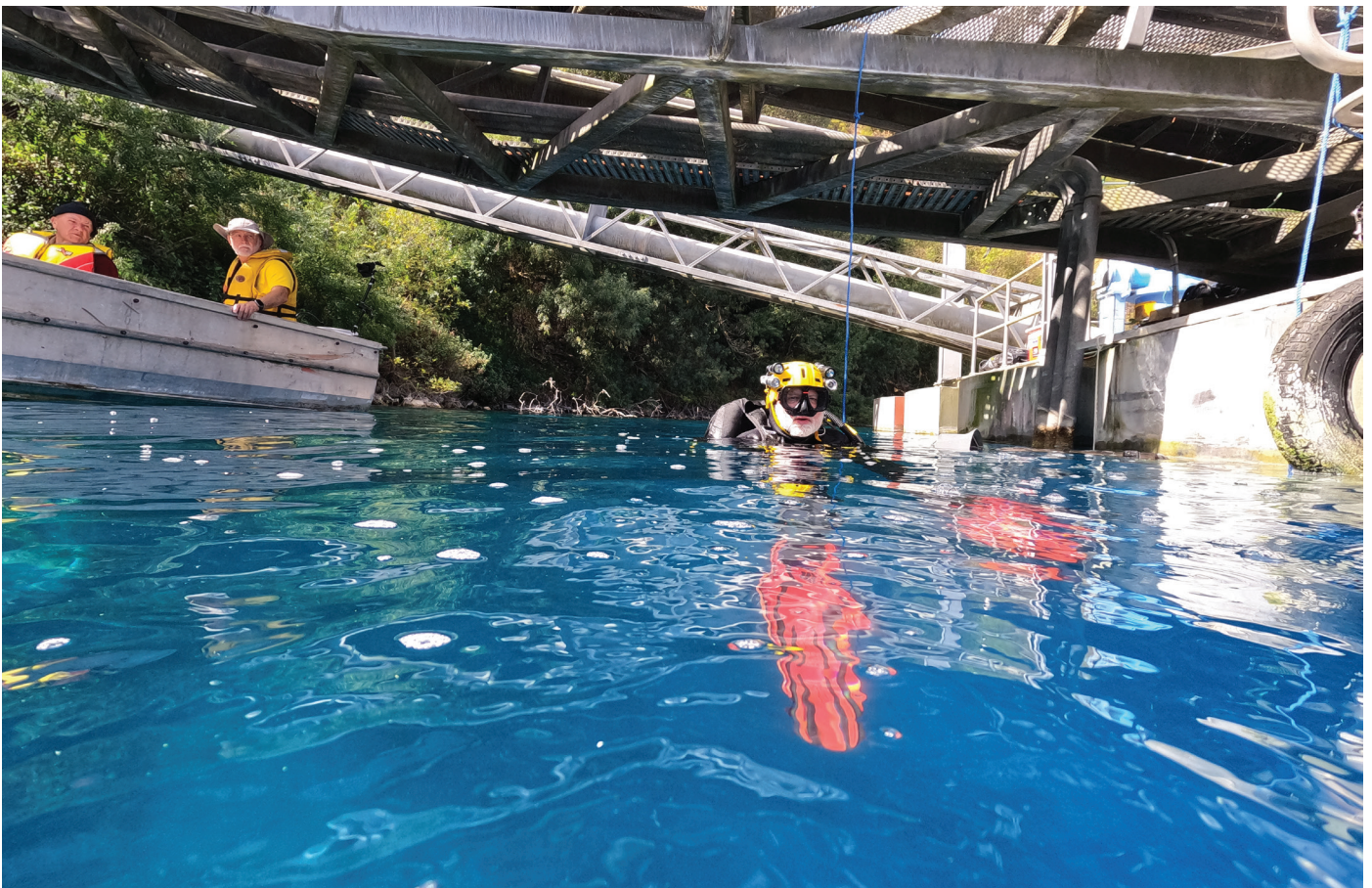


## FUTURE INVESTIGATIONS

SA Water supervisors commented that our research has generated more questions than answers and I am preparing a request for a follow-up scientific investigation to expand on our discoveries, observations and information data. February is the best time to conduct such dives due to water temperature, clarity and optimal summer daylight conditions. This is a Citizen Science project that relies upon skilled deep divers familiar with Mount Gambier freshwater conditions. If successful, I would like to rotate other CDAA divers to assist me with observations and intend as a priority to concentrate on the northern cliff lines zone for obtaining water quality and inflow information. It is a privilege that CDAA divers can contribute important data to the city water supply security for a future of anticipated decreasing rainfall. Special acknowledgement goes to Simon Sherriff and Maree Shepherd of SA Water for supporting this project. We would all like to sincerely thank SA Water for permission to access the Blue Lake to undertake this scientific research.



One of the stromatolite forms at a depth range of 14-18m.  
Picture: Mark Simpson



Ian prepares for a dive. Picture: Mark Simpson





## THE SOUTH EAST: A REGION IN CRISIS?

● By Richard Harris (CDAA #1360)

**Water levels up, water levels down. For those members who have long been visiting the Cave Divers Association of Australia heartland in the Lower South East of South Australia, levels in the caves and sinkholes have always been on the move. Like the ocean, the aquifer has always been a constant, an essentially infinite resource. In summer we see the centre pivots drenching the green pastures. In winter, large temporary lakes on the road side are a common sight with water birds taking up temporary residence. Driving through the pouring rain in the back blocks of Glencoe watching the local amphibians playing Frogger on the road was the norm!**

But like the ocean, if you look closely, the water table has been showing signs of stress for a long time. In 1986, when I did my Cat I/II training I was disappointed to not be rewarded with a final dive in Piccaninnie Ponds. National Parks and Wildlife Service (NPWS) South Australia believed the aquatic plants were suffering and divers might be playing a role, so best keep us out. It was many years later that I got to dive there, but I always wondered if the famous ponds were not quite as clear as the images I had seen from when Ron and Valerie Taylor filmed there or David Doubilet took his famous images. Still, it was an amazing place and the rest of the caves seemed crystal clear, so I didn't worry.

The events in Thailand in 2018 have given me an opportunity to pursue my film making dream more seriously and last year I produced a short film about the region and the water in particular. In the process of examining the

beauty of the area, I became increasingly aware of the threats to the groundwater. I have tried to educate myself about the various industries and individuals who rely on the groundwater for their livelihood, and also how the water is allocated to ensure its sustainability. Regional Water Allocation Plans (WAPs) are administered by the Limestone Coast Landscape Board, with the review of the plan supported by a stakeholder advisory group. The WAP was reviewed in 2022/2023 and is currently being amended. When the amended WAP is released, it is possible that many water users are going to see their allocations cut, which could have a major impact on productivity. Some farmers are already thinking about how to use the land differently, for example changing to crops or livestock that don't require largescale irrigation. Industries like the wine makers have already changed from spray irrigation to drippers to be more efficient with their water allocation. The coastal springs are the "end users" of the unconfined aquifer as it flows out to sea. They are very fragile groundwater dependent ecosystems which hold important biodiversity, including at risk species only found in these areas. NPWS are the caretakers of some sites but the landscape board and South East Water Conservation and Drainage Board are responsible for water up or downstream from the sites. A good example occurred last year, when the drainage board undertook routine maintenance on the 8 Mile Creek below the Ewens Ponds Conservation Park. In past years, such activities have caused very temporary falls in the water levels in Ewens. On this occasion and due to the low levels in the

aquifer, the large drop seen in the ponds did not immediately recover and the ponds were closed to recreational activities to protect the aquatic plants. Recovery was slow but the ponds were re-opened. However, the ongoing drought has again led to a closure which remains in place currently.

It is easy to be critical of NPWS or the drainage board for inadequate management of these sites. Piccaninnie Ponds has suffered greatly over recent years to the point where it resembles a barren wasteland with high water temperatures, high nutrient loads, poor clarity and a shocking loss of flora and fauna species. Nearby springs are running dry, or with increased salinity due to salt water intrusion from the ocean - a result of lower hydrostatic pressures from the unconfined aquifer. Personally, I am very sympathetic to the NPWS staff and landowners in this area. They have a great deal of scientific and practical expertise, but lack funding to do adequate research into some of the contributing factors. An example is the increased nutrient loads being measured in Piccaninnie Ponds. Because the water entering this spring may be 30 years old, it is very difficult to know whether nutrients are from local agriculture or from the die back of peat beds or algal overgrowth. Or even from an event 20 years ago somewhere in the aquifer. Artificial management of water levels using weir systems in Piccaninnie Ponds or reed cutbacks in Ewens is not helping. The catch 22 is that higher water levels are required to stop peat exposure, plant loss and saltwater intrusion. But using weirs to maintain levels will slow water transit times and encourage water temperature increases and boost algal growth. Basically, you are dammed if you do and dammed if you don't. It seems the only solution to save these sites is more water in the aquifer producing increased flows. And that can only come with higher and more consistent rainfall and/or decreased extraction by humans. It's complicated!

## WHAT CAN THE CDAA DO?

Good question! Like the politicians, we can't make it rain. But science and conservation are a strong part of our ethos so we have an obligation to monitor and report what we see, treat the caves and springs with respect and advocate for the ongoing conservation of these and other karst systems. We have enormous expertise within our ranks. Our national director and science officer have expertise in



Images from Piccaninnie Ponds in late 2024 showing the almost complete loss of flora and the warm opaque thermocline near the surface.

groundwater systems. Our site director has massive experience in understanding the issues the agriculture sector faces. And we have other members with very relevant skills. Perhaps the CDAA should lobby for representation on the WAP Stakeholder Advisory Group?

The graphs showing rainfall trends, spring discharge and groundwater levels have all trended downwards since 1970. The weather patterns have changed, with the regular fronts moving southwards leaving southern Australia in a persistent pattern of calm weather and low rainfall. This drought is not an isolated phenomenon, but a bad year on a baseline of worrying trends. The water table is at the lowest level on record. Discharge rates from Ewen Ponds are at the lowest levels on record. The Piccaninnie Ponds ecosystem looks dead. One of our premiere dive sites has been lost.

I believe that what we are witnessing is a result of a pattern of drying that has been documented since at least 1970. The climate is changing. I don't care if you think humans are responsible or if you think it's a natural cycle. The data suggests it is happening and if the water continues to decline, we will lose the Ramsar listed wetlands like Piccaninnie Ponds and all the associated biodiversity. If for no other reason than losing access to more dive sites, CDAA members should be greatly concerned. ➡

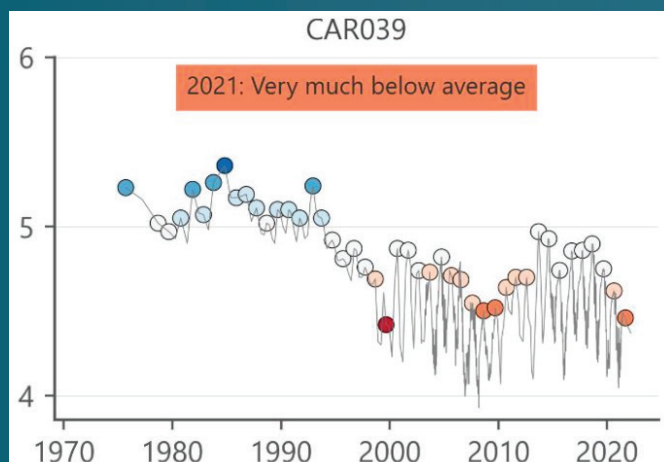


## REFERENCES

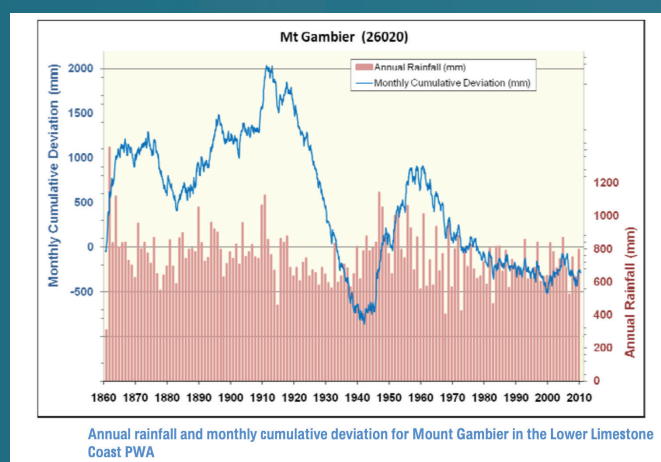
Lower Limestone Coast PWA Groundwater Status Report 2009–10 | 1 | Department for Water. Government of South Australia.

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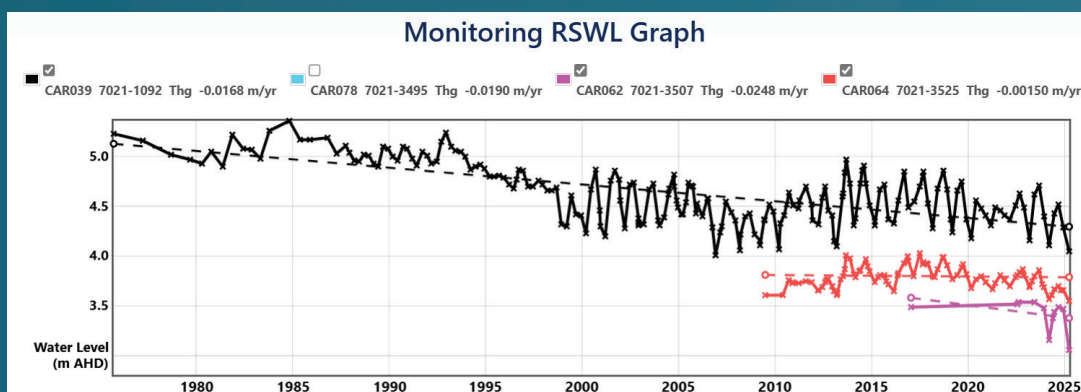
Graphs prepared by DEW based on data from [engage.landscapepsa.com.au/llcwap/observation-wells-LLC](https://engage.landscapepsa.com.au/llcwap/observation-wells-LLC) and Water Data SA.



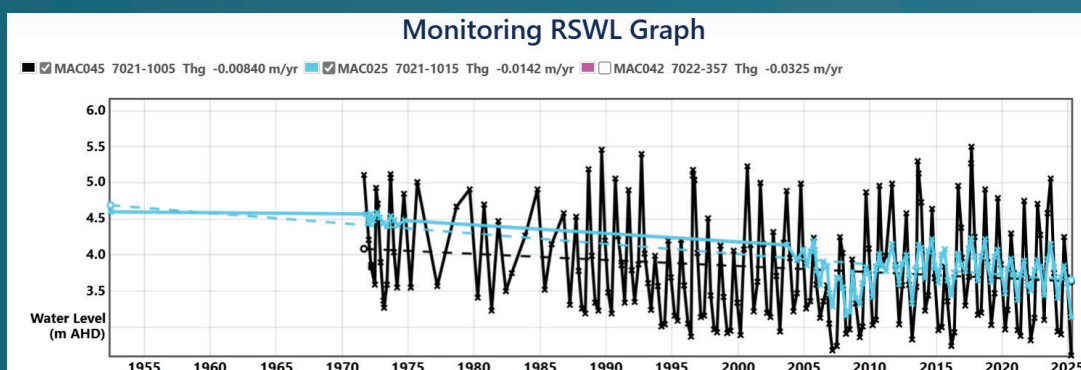
A slow decline in levels is seen in test well CAR039 near Piccaninnie Ponds. The erratic changes from just before the year 2000 reflect seasonal swings due to new centre pivot irrigation in the area.



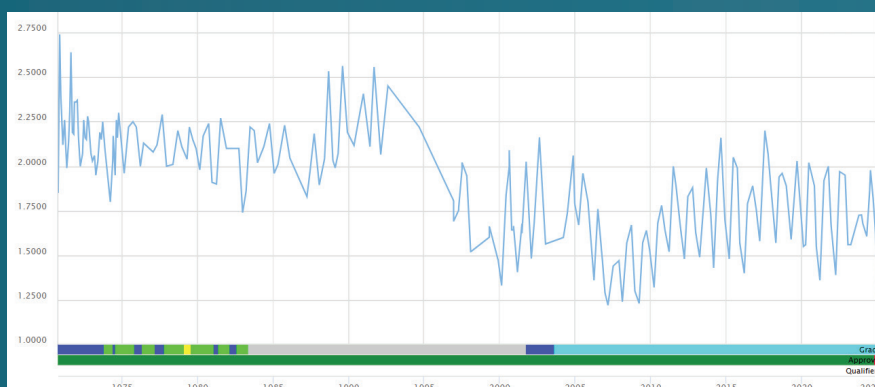
Mount Gambier rainfall records since the 1960s show a gentle overall trend towards drying, with an obvious wet period in the early 1900s followed by a severe drought at the end of the Second World War.



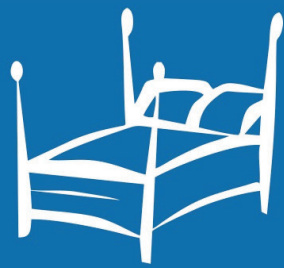
Water levels continue a gradual decline measured with test wells in the Piccaninnie Ponds area.



The dramatic drop in levels last year following downstream reed cutback can be seen on this chart. Recovery was slow and levels in Ewens Ponds have now dropped to a new record low resulting in ongoing closures.



Discharge from 8 Mile Creek to the ocean from Ewens Ponds continues to drop.



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A diver cruises along the guideline.  
Pictures: Sean Elliott

## THREE SISTERS PROVIDES UNIQUE EXPERIENCE NEAR MOUNT GAMBIER

By Sean Elliott (CDAA #5245)

I was privileged in early March to be invited to be in the first group to get back in the water at Three Sisters Cave. This site had been closed for quite a few years due to safety concerns. Through the hard work of some dedicated people, the entry was moved, made safer and new guidelines developed on how to access the site. Due to the changes, we have regained access to this amazing site. Please ensure you observe the site-specific requirements so we do not risk losing access again.

It is really good to see a site reopened and we all owe our thanks to those involved. This site was originally called the Three Sisters because it had three small openings and we know it was at first documented at least as early as 1933 by Australian anthropologist, archaeologist, entomologist, ethnologist and Order of Australia recipient Norman B. Tindale (October 12, 1900 - November 19, 1993).

These days there is only one hole left which has an added concrete pipe and locked lid with enough room for one diver to go down at a time.

Divers need to descend approximately 18m to the rock pile below or the same as a six-storey building. It is nice and easy with a winch and as I was slowly lowered all I could imagine was how hard it would have been to get in without one.



The new entrance to Three Sisters.

Once you drop down the 18m to the top of the mound you are greeted with what is a large dry cave for Mount Gambier. It has more of that feel of being out on the Nullarbor and is quite spectacular. There are some impressive Speleothems on the far wall and all the roots coming through make this dive worth it for the dry section alone.



The new entrance to Three Sisters.



Decorations adorn the walls of the dry cave.





Divers prepare to enter the water. Pictures: Sean Elliott

Once you are at the top of the rock pile, you need to carry your tanks down to the water's edge, so unlike our group who underestimated the work involved, I would suggest you move all the gear down before putting your drysuit on. It's not too bad but obviously in a humid cave already with your dry suit on, it was a bit warm.



Kelvyn Ball and Steven Meyer prepare to dive.

There is quite a bit of rubbish in there that over the years people have thrown down and loads of bones. We joked that if it was a movie you would be thinking there was a dragon waiting for its next meal or some mutant snake hiding in the shadows.



Bones and remnants of the past litter the cave floor.

The dive starts at a small pool where it is easy enough to get in and the water is crystal clear. This site is advanced cave rated and sidemount only as the dive has quite a long restriction/flattener near the start.

The fixed line is still there and easy to find just under the ledge at the start of the pool. It quickly drops into the restriction, which is quite a few metres long and about 30-40cm high. It has a bit of width to it but the trickiest element is that it is on an angle that is close to vertical so you need to proceed headfirst down this slab of rock. However, it is pretty easy in sidemount and we didn't have any trouble getting through, but I'm pretty impressed that anyone in a backmount setup ever got through that flattener, especially given how steep it is.

It was a little silty since nobody had been through it in a number of years but it was not as tight or silty as I was expecting. The fixed line ends just after the restriction so you will need a reel to continue as it pops out into a nice big clear room. It's quite a big room and much bigger than I was expecting after reviewing the map pre-dive.

The map is not quite right in my opinion because the marked room at the bottom is there but then there's another room after it which is where the 32m depth is reached.

We didn't look around too much, simply because there were other divers that were going to get to enjoy that cave that day and we didn't want to silt it up, especially since we were the lucky first group.

I really enjoyed the dive. Don't get me wrong, it's not a massive cave but it is certainly worth having a look. Even if it's just to experience the dry cave section and get to enjoy something new or maybe somewhere you just haven't been in a while.



Divers prepare to enter the water.



If you would like to see video I took that day please visit my channel at [www.youtube.com/@seanpe80](https://www.youtube.com/@seanpe80)



## DEEP TIME AND DARK WATERS: UNEARTHING ANCIENT SECRETS IN SOUTH AUSTRALIA'S CAVES

By The ARC Deep Time Extinctions Team

South Australia's limestone underworld once again played host to an ambitious scientific expedition in April as part of the ongoing ARC Linkage Deep Time Extinctions and Environments in Australian Underwater Caves research project led by Professor Julien Louys of Griffith University. With support from the CDAA and a team of skilled divers and researchers, the latest trip blended rigorous science with cave diving success.

The team set out with a dual mission - to recover dosimeters that had been placed in various cave systems to monitor environmental conditions and to collect water, bone and sediment samples for environmental DNA (eDNA) analysis. The ultimate aim? To paint a clearer picture of how life - and death - unfolded in and around these subterranean worlds over thousands of years.



The underwater search in Fossil Cave yields results.

One of the expedition's early highlights came from Engelbrecht East, where divers retrieved all three target dosimeters along with a surprise bonus - a fossilized jawbone of a short-faced kangaroo discovered within the Engelbrecht Extension. Surface sampling for eDNA was carried out simultaneously by the surface team.

Tank Cave presented more of a challenge. The team aimed to recover dosimeters from the Bone Room but were stymied by confusing line configurations. The team regrouped at Tank Cave, where a quick survey dive yielded some unexpected finds - tiny calcite rafts and small bone fragments in a niche at the entrance of Tank Cave. The team has since clarified the line situation in the Bone Room, setting the stage for a possible return in a few years.

Meanwhile, Gouldens offered both progress and puzzles. One dosimeter was successfully recovered, but another proved frustratingly elusive despite multiple return dives and guided assistance. This was disappointing as the dosimeter could only have been moved by fellow divers at some point. The team did, however, gather valuable water samples from depth, contributing to the growing eDNA dataset.

The collection of dosimeters from Fossil Cave proved equally frustrating. While all the



dosimeters were successfully collected, all but one had clearly been moved sometime in the last year and a half. It is not known what effect this will have on the measurements of the gamma doses, but it does add a further variable that won't be able to be controlled in the modelling. Hopefully the data will still be useful. Some additional small fossils, sediment and calcite rafts were collected for the eDNA project and most of this is now in a specialised cold storage facility at Griffith University awaiting analysis.

Another noteworthy moment came at Piccaninnie Ponds. While the CDAA team collected deep water samples, Julien and his PhD student Meg Walker conducted a detailed exploration under special permit. Their dive was productive, but not without concern as algae growth – although not suspended – was easily disturbed, signalling potential ecological changes worth monitoring closely.

The final dive of the trip took place at The Shaft, where both surface and deepwater samples were collected on a 100-minute runtime dive. It was a fittingly strong close to an expedition marked by both scientific success and the ever-present challenges of underwater research.

Looking ahead, the only lingering task is a dosimeter left in Tank Cave's Bone Room. With no spare control dosimeter available, the decision was made to leave it in situ for long-term monitoring. In the meantime, the collected dosimeters are in France, where analysis will help determine the age of the fossils preserved in South Australia's flooded passageways.

One critical observation from the trip was water levels were notably low across every site. Fossil Cave in particular showed signs of exposure

not normally seen – bones usually submerged were now visible at the entrance, vulnerable to both accidental damage and disturbance. It's a timely reminder that these delicate systems need our respect and protection now more than ever.

While this trip represents the last major fieldwork for The Deep Time Extinction Project, the team will continue to open new windows into our past. It couldn't have happened without the skills, patience and dedication of Australia's cave diving community. We thank the CDAA for ongoing support and a special thanks to Damian Bishop, Benn Walton and Kelvyn Ball, who have been there from the beginning. The journey doesn't end here and we hope to have some exciting results to share in the very near future.



The dropping water level led to changed conditions at Fossil Cave.



A sample is secured in Fossil Cave.



Algae hampered research efforts in Piccaninnie Ponds.



Putting 4 x 200W lights to good use in El Dorado.



## A BIG WIN AT MASTERCAVE OR BUST

Stephen Fordyce (CDAA #4418)

February 2025 saw a spectacular win at “Mastercave or Bust” and one of the greatest discoveries in my cave exploration life. In four days and three nights underground at -400m in Niggly Cave, we bypassed the terminal rockpile (“Meru”) and explored 1.2km of fresh borehole underground river tunnel. No diving was involved ... yet. The trip theme song Stayin’ Alive did a good job reminding us to be careful and as Kynan pointed out, it would also have been useful for keeping the rhythm if CPR was needed. Truly a theme song for all occasions.



Council of war at the Florence Rockpile.



Mastercave or Bust is a game the Southern Tasmanian Caverneers (STC) cavers play in Tasmania, where we do lots of repetitive, miserable, nasty, desperate caving to try to find new pieces of the master cave - the combined flow of lots of the little streams from smaller caves. Mastercave or Bust is based on the idea that if you knew the big stuff was there, you would put in a near infinite effort to get there - well it is just there, so go on then. Most games end in a "Bust" result, and you have to try again or face giving up. It's mostly dry caving, but with all that water getting about, inevitably there are sumps to dive occasionally.

Niggly Cave is the longest running Mastercave or Bust project I've been involved with and the subject of several gnarly push dives I have previously done. I first pushed the "Meru" downstream terminal rockpile eight years ago (there was 2km of borehole, then a 5km gap until the water was seen again at the Junee Cave resurgence). I've been leading the project for most of the time since then and we have been focused on the terminal rockpile for the last four years. I've spent about 100 days and 75 nights in the cave across 23 camping trips and was starting to wonder how many I had left in me.

Of course, caving is a team sport and many people over the years have helped with survey, portaging, aid climbs, dives and much grovelling through mud into unlikely leads. The current project builds on previous projects going back to the discovery of the cave in the 1990s and exploration of others nearby even earlier. It takes a village ... and standing on the shoulders of giants to achieve a big breakthrough like this.

The Butterfly Effect passage had a draught that gave us hope, but it took about four visits over two years to push, dig, stabilise and break through into the Chrysalis Streamway. This trip we finally had low enough water to worm our way through wet rockpile and break into El Dorado - the lost cave passage of gold. This was about lunchtime on the first of our two push days, so the 8-person team took full advantage of the rest of the trip to survey/map 1.2km of giant (20m x 20m) new mastercave and some side leads. We also had some big lights and were able to take some pictures showing the size of the new finds. ➡

Niggly trips are always cold (7degC), usually wet (to the waist if you aren't careful) and hard (in all the ways), but slogging our way 400m vertically up pitches, climbs and assorted meanders, it was slightly easier knowing the exciting news we carried. In a small but personally meaningful way, the world had changed and I doubt any of



The mudbanks and mud everywhere really are a reminder of flooding.



Shout out to CDAA member Ashlee Bastiaansen who embraced the ways of cave life on her first Niggly trip, despite the unfortunate hole in her suit.



us will ever forget that feeling. It took a couple of nights before most of us got a proper sleep!

The new El Dorado section ends 4km from the entrance at the Florence Rockpile (a nod to the tunnelling machine used in the ill-fated Snowy 2.0 Hydro project) which did not yield to a cursory poke at the end of the day, but was pushed through fairly easily on follow-up trips by the locals. It remains wide open and waiting for a return next summer.

They also pushed and surveyed the Valentines Inlet side lead which came within 18m of the end point of a truly awful dive I did in Sesame Cave a few years back. There is a reasonable looking sump on the Niggly side that will be dived for

a connection attempt in summer (shudder, but at least I'll be going upstream, with a chance for visibility). Another side lead (Myopia) yielded nearly a kilometre of new passage and comes within 60m of Voltera – a current project cave with miserable (dived) sump, but with potential dry bypasses.

Fingers crossed for things to go our way next summer!

**Note: painstakingly detailed trip reports are published in the Speleo Spiel, STC's journal.**

The Breakthrough Team







Digging the tunnel in the 1920s.

# Undersea tunnel to adventure



Weekend Australian newspaper article, June 1986

## SYDNEY UNDERWATER TUNNEL ADVENTURE

By John Dalla-Zuanna (CDA #236)

**Back in 1985, John Vanderleest brought to my attention a story segment on Simon Townsend's Wonderworld. It was an interview with James Dargan, a former Department of Railways employee, who in his retirement wrote several publications including Sydney's First Harbour Tunnel published in 1984. After some quick enquiries, I went to Sydney and met with James.**

Whilst we had afternoon tea, I was immersed in this fascinating story which began at the turn of the 19th Century. A little-known story of Australia's first major engineering feat without any overseas expertise which nearly one hundred years ago (1926) was completed to supply power to the then emerging electric tram service for Sydney.

In the later half of the 1800s, Sydney's rail systems were steam driven and whilst efficient and economical, steam trams and trains were smelly, noisy and required many people to operate them. The steep grades of some areas near the central metropolitan harbour were also a problem as the trams could not cope so a cable tram was established to carry passengers up these hills. Steam machinery was set up with large wheels to operate the cables to pull these

trams along these steep gradients.

With the arrival of electricity in 1890, the railways embraced this new technology and within a short three years had tested and set up electric equipment to replace the steam power station, with the first in Ridge Street in North Sydney for the cable trams. The exercise with clean and powerful electricity proved so successful that the decision was made to convert the whole of Sydney's steam trams network to electric powered trams.

With this, the Ultimo Power Station opened in January 1900, supplying power not only to the southern suburbs of Sydney, but with power cables laid across the harbour via the shortest route - 550metres from Long Nose Point to Greenwich - the northern suburban trams were serviced as well.

However, an unforeseen problem developed where big ships anchored nearby were dragging their anchors, especially in very strong winds and on occasions had severed the cables, causing not only a disruption to the northern tram services but a costly problem also.

For a permanent solution, putting the cables through a tunnel under the harbour was decided with the current shortest route, between Long



Nose Point and Greenwich, being the obvious choice.

The story of the tunnel's construction is a tale on its own, begun in 1912 and for twelve years, men fought a long and courageous battle with obstacles thrown at them, but finally in 1924 the final fit-out of Sydney's first harbour tunnel began and finalised in 1926.

During my afternoon tea, I took photos of some of James' notes and tunnel blueprints and went off in search of the entrances to this tunnel.

Firstly, I discovered that the entrance on the Greenwich side was buried almost under the carpark at Mann's Point with a concrete slab with a sealed access plate and the smaller vertical shaft/manhole nearby choked with debris – so off to the other side of the harbour I went.

Here at Long Nose Point, I discovered what looked like a small boat shed with activity resembling what might have been a tunnel entrance so I doorknocked a few houses nearby and found the owner of the shed on the corner block and expressed my interest in the tunnel and its back story.

With a key in hand, I went into the shed and found a trap door in the middle of the floor, which led down into the tunnel.

The tunnel was 6ft wide and 8ft tall. On my left were copper shielded submarine cables arranged on concrete shelves and along the right wall were ceramic insulators spaced every 10ft to carry a communications wire along the tunnel.

Working my way down the tunnel over strewn debris, following a narrow-gauge train rail, I arrived at the water's edge.

My main buddy was Simon McCartney, reaching a depth of 76m with runtimes approaching 120 minutes (approximately 70 minutes in deco),



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but was never able to find or get to the pump room, which I now know was closer to the Greenwich end - a distance of nearly 500m from Long Nose Point. (By the way, recreational trimix diving in Australia began in 1991.)

I undertook six dives into the tunnel system with a few colleagues during the 1985 -1986 period before the shed was pulled down.

There was also an article in the Weekend Australian by Sheryle Bagwell about our diving experience.

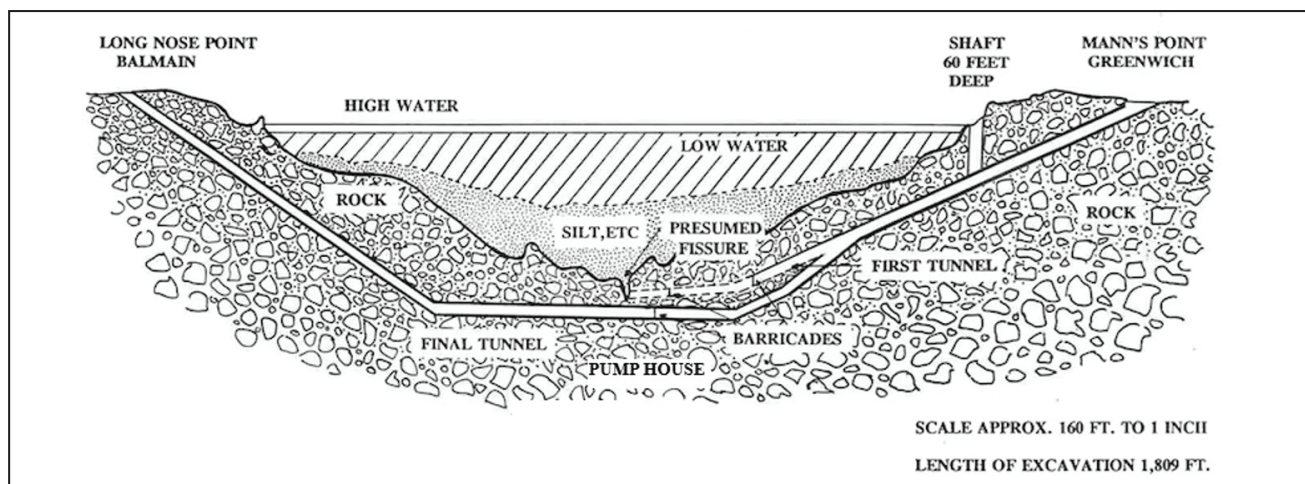
During the period 1986 to the early '90s, some of the Sydney cave diving community gained access from the Greenwich side, as indicated in the ABC article available at [www.abc.net.au/news/2017-12-21/sydneys-first-harbour-tunnel-curious-sydney/9234518](http://www.abc.net.au/news/2017-12-21/sydneys-first-harbour-tunnel-curious-sydney/9234518)

I have since tried to access the tunnel on a number of occasions, but have had difficulty in getting access again.



The sealed entrance at the Greenwich end of the tunnel.

## THE FIRST SYDNEY TUNNEL - (COMMENCED 1912 - COMPLETED 1926)



A sketch of the Sydney tunnel.



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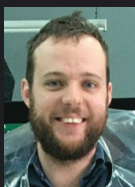


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**MATT IS A FELLOW CDAA MEMBER!**



# WINBIRRA CAVE – NULLARBOR WITH A DIFFERENCE

By Stephen Fordyce (CDAA #4418)

**PICTURES:** Stewart Donn

**EXPEDITION PARTY:** Stephen Fordyce,  
Ryan Kaczkowski, Andrea Russo, Stewart Donn



The Winbirra entrance lake, with Steve for scale.

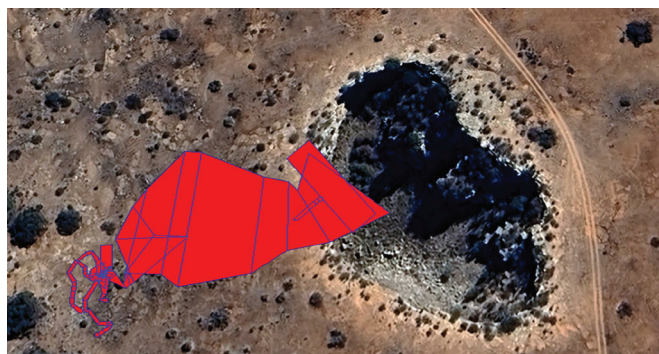
**A long time ago, in a pre-COVID galaxy far away, an interesting side-quest called. After a few false starts, a couple of days were dedicated to Winbirra Cave - a seldom-dived cave on the Nullarbor high plain. After a number of years, not to mention a global pandemic, I finally got around to writing this report. Better late than never.**

Yes, there are a few obscure caves on the high plains which go to water. Winbirra is the southernmost of a line of four big dolines (from north to south: Chowilla Doline, Abrakurrie Cave, Kutowalla Doline, Winbirra Cave) and the only one which reaches the water table, about 90m vertically below the plain. It had been dived before, but only a handful of times – not least because it's a steep, loose and high-cardio scramble and some squeezing to a small pool with a couple of pokey underwater leads. All the effort of any high plains Nullarbor Cave with a dive less inspiring than Mud Hole in Mount Gambier.

Winbirra and the associated caves are on private land belonging to Mundrabilla Station, so permission is required to visit and to camp there (plenty of low scrub and shelter for camping). There is a small population of bats in the chamber at the diving pool, which must be carefully considered.

## SURVEY AND MAPPING

We completed a DistoX laser survey from the top of the doline down to the pool and the primary tie-off. We added to the existing line and left three lines in place (don't be doing this in CDAA-managed sites) along with labelled cookies and arrows which are survey stations.



The sealed entrance at the Greenwich end of the tunnel.

**NORTHWEST LINE:** Heads northwest initially, but then loops around to the south through the rockpile, staying at about -10m and ending fairly comprehensively in rockpile. 36m from home tie-off.

**SOUTHWEST LINE:** Drops gradually down, passes 5m above the end of the northwest line, zigzags to the south and ends at -15m in an angled downward choke which we put quite a bit of desperate effort into pushing. 34m from home tie-off.

**SOUTH LINE:** Goes into rockpile and ends at -2m. 10m from home tie-off.

You'll see from the plot that there was also an alternate way into the northwest line, but it wasn't very nice. ➔

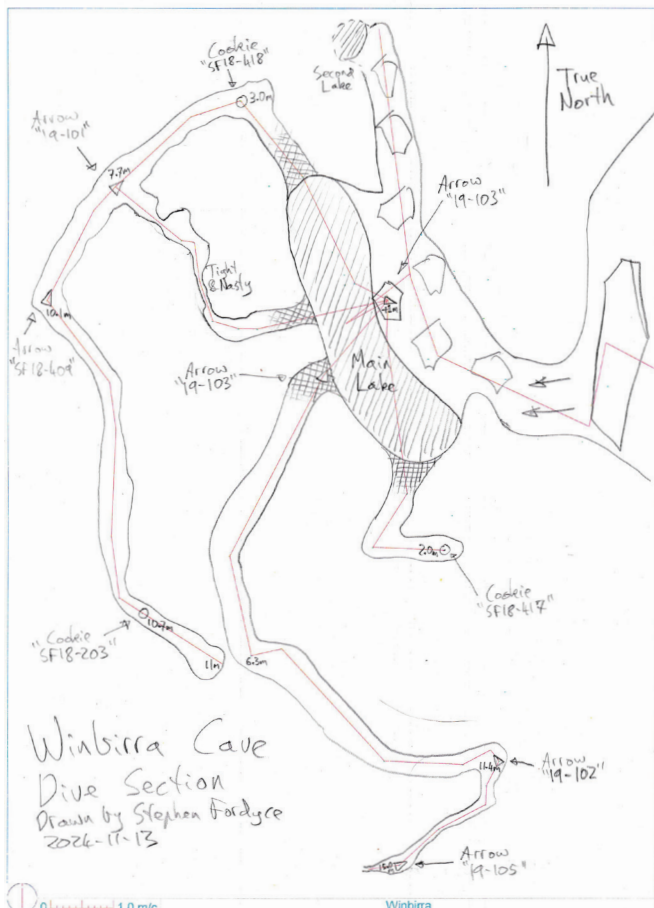




Ryan (with beard) and Andrea about to dive.



The hauling was enough to even make Ryan tired.



A sketch over plotted survey data to show the dive sections.

The visibility was pretty wrecked by one diver, although cleared reasonably overnight. Diving was done with a mix of 7L steel and 11L ally tanks and was quite okay in a wetsuit (water temperature a uniform 22C). The diving wasn't very inspiring, with frequent tight and wriggly bits. It was definitely for experienced sidemount divers only.

## CONCLUSIONS AND CONJECTURE

We were fairly excited to be there and pushed the underwater leads pretty hard (I logged three 85 minutes dives) in the few days we had. Nobody felt it was worth spending any more than the three days we gave it and we have never felt the urge to go back.

Seeing the main slope of the doline collapse going to the west side with the lake is, well, a bit uninspiring. We had hoped the lake would be on the north or south, in line with the line of caves and where a major conduit presumably runs (or once ran). If the collapse is roughly over the centre of the big conduit, then the small Winbirra lake and underwater section is off to the side and likely just a quirk of the collapse.

And yet, nearby Abrakurrie Cave provides an example of a giant dead-end side chamber, which with a bit of optimism could give a slight hope that the Winbirra collapse could actually be off to one side of the main conduit.

Another angle (which others have and continue to study) is that the main conduit linking the four caves has mostly collapsed and filled with sediment. There are hints of this to the casual observer looking at satellite photos and on site.

Finally, Ian Lewis mentioned at the 2024 symposium that a ground penetrating radar scan hinted at a SECOND giant cave running parallel to Abrakurrie, not far away.

So, it might not be cave divers who write the next chapter, but the story of Winbirra probably isn't finished yet.



The Winbirra doline and surrounds.



FROM THE DIRECTOR OF  
SHERPA & MOUNTAIN



# DEEPER

"ASTOUNDING  
AND NAIL BITING"

- JOEL EDGERTON

**Screening Details: [garage.com.au/deeper/](https://garage.com.au/deeper/)**

SCREEN AUSTRALIA PRESENTS  
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CINEMATOGRAPHER AND FIELD DIRECTOR: BEN DOWIE CO-DIRECTOR: ALEX GARRY PRODUCED BY BLAYNE HOFFMAN WRITTEN AND DIRECTED BY JENNIFER PEEDOM



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MADMAN

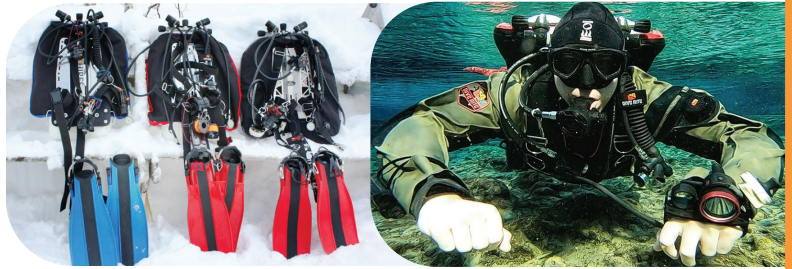


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# Pine Tank Lodge

Photo by Liz Rogers



## LODGE FEATURES:

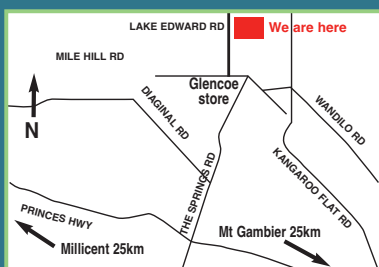
- ✦ Accommodates 14 divers in 7 rooms; three double bedrooms and four rooms each with two single beds.
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# MEXICAN CAVE SYSTEMS - OX BEL HA

By Skanda Coffield-Feith

## WHAT IS A CAVE SYSTEM?

When we refer to a cave system we are describing a water filled cave with more than one entrance. While this is unusual in Australia, with Tank/Fossils being an exception, in Mexico it is the norm. Cenotes are often connected through the cave passages, and single entry caves are a bit more of a rarity. In the Nullabor, the big caves like Cocklebidy or Pannikin Plains are characterised by multiple sumps or flooded sections, forcing divers to get out of the water and transport their equipment to the other side of the dry section before continuing to dive. However, there is only one way in and one way out - through the cave entrance you came in! In contrast, the Mexican cave systems are known for their complexity as there could be multiple ways to get back to your entrance or the option to traverse to another entrance cenote and exit there. This brings me to my next point about the complexity of navigation in Mexican caves. While the system arrows may point to an entrance, this may not be the entrance where you began your dive. With so many diveable cenotes, this article will begin to explore the cave systems here in Mexico.

## CAVE DIVERS' PARADISE

In the stretch of coast from Cancun to Tulum (and just south) there are more than 1680 kilometers of explored underwater cave. This does not count the 360 kilometers of reported dry caves! And this number, 1680 kilometers, comes from the Quintana Roo Speleological Survey (QRSS), whose data is made up of the survey data reported by explorers since 1990. There are certainly more unreported or unsurveyed cave lines in the area and estimates put the current amount of explored cave in excess of 2000 kilometers! So we have a whole lot of diveable caves here. Let us dive in and look at some of the biggest cave systems in the area.

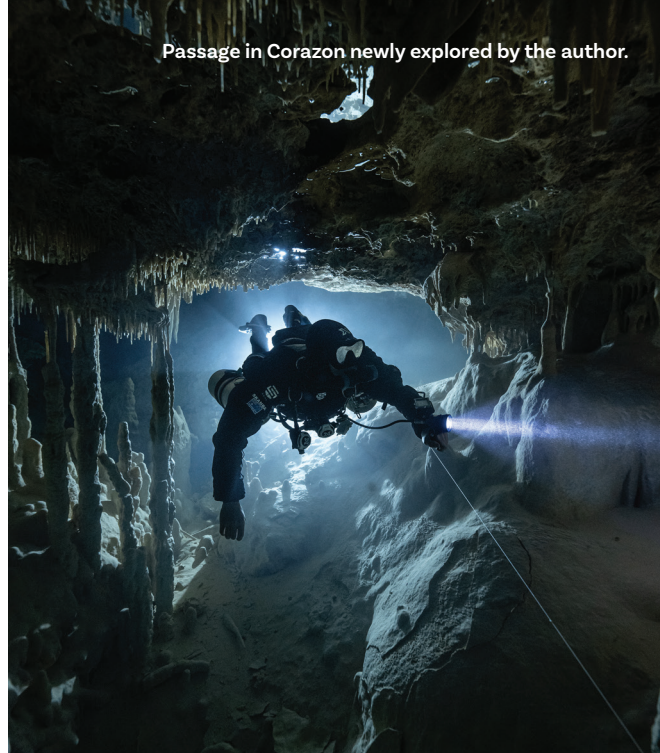
## THE OX BEL HA CAVE SYSTEM

The biggest cave system, in terms of length, is the giant Ox Bel Ha (OBH) cave system. This mega labyrinth of tunnels is reported to have over 500 kilometers of explored cave (there is a discrepancy in length between various data). The OBH system stretches from Tulum in the north to the Sian Kaan Biosphere in the south and (mostly) from the 307 Highway down to the sea. As exploration continues it is sure to expand further! The "classic" Ox Bel Ha area was centred around the three "rivers" where water flowed through the cave passages to exit in the sea. Significant exploration began in 1998 when the Grupo de Exploración Ox Bel Ha (GEO) began to focus on these caves.





Álvaro Herrero I@mekanphotography



Early exploration involved setting up base camps in the jungle and camping out while diving and exploring. Team members of GEO were Bernd Birnbach, Steve Bogaerts, Fred Devos, Christophe Le Maillot, Sam Meacham, Bil Phillips, Daniel Riordan and Sabine Schnittger. Over time many other divers have contributed to exploration of the system and other cenotes (and cave systems) have been connected in.

## SISTEMA NARANJAL CENOTES

Many divers would be familiar with the caves Mayan Blue, Cristal and Jailhouse. If you have done any cave diver training in Mexico you might have visited one of these cenotes. These caves each have their own beautiful cartographic map made by Jim Coke in the 1990s (with exploration done by various divers in the 1980s and 1990s). These are popular dive sites, easy to access with a huge variety of dives to be done and extensive cave passages to see. Whether you want to just dive with two tanks or do a multistage scooter dive, these sites have got you covered! Big, dark tannic stained freshwater tunnels and stunning saltwater sections give dives in these locations very different looking dives at the same site. With some other cenote entrances, such as Cenote of the Sun, these caves made up Sistema Naranjal. These caves are significant archeological sites as three human skeletons have been found predating the flooding of the caves at the end of the last ice age. In 2011 Steve Bogaerts and Bil Phillips connected

Naranjal with OBH through Jailhouse. This was a massive contribution to the overall length of OBH with Naranjal extending into the jungle to the northwest of the highway.

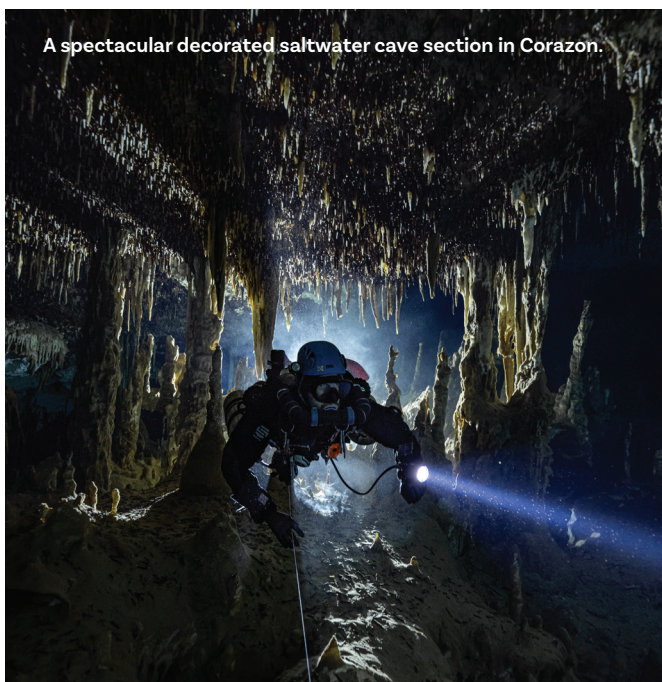
## CHUUP ITCH OR CORAZON DEL PARAISO

Bil Phillips and Steve Bogaerts originally explored this cenote in 2001-2003. Many of their original markers can be seen on the main lines of the cenote. They connected it with a section of Ox Bel Ha. Back in 2001, there was no road into the cenote, so explorers and their helpers (“sherpas”) carried in everything needed for their dives from the 307 Highway. The original explorations were a part of an official Explorers Club Flag Expedition. In 2015-16 Bil Phillips returned and conducted further explorations with Dan Lins in the upstream section. Since then the cenote has been opened up with a nice road and facilities and it is a much easier place to get to than in the original explorations. Similar to the Naranjal cenotes, Corazon has a dark, tannic stained freshwater section and a halocline at 14 meters below which is white, pure limestone. From the cenote, divers can dive either upstream or downstream and see a nice variety of formations and different sized passages. Since the cave was opened to the public a few divers have continued the exploration, finding many more kilometers of cave. ➡





A spectacular decorated saltwater cave section in Corazon.



## YAX CHEN

Cenote Yax Chen was first explored by Gary and Kay Walten in the early 1990s. They did a lot of exploration in the area and unusually most of it was from the same cenote. Yax Chen is a huge lagoon in the mangroves on the other side of the beach road, making it just a stone's throw from the Caribbean Sea. There are outlets of the cave into the sea. Most of the cave extends off to the northeast, heading inland under swamp and mangroves. The principal cave tunnels are massive subway-sized power passages, stained dark by the tannins being washed into the cave from the mangroves above. The cave was connected to Ox Bel Ha and in recent years has seen further exploration from teams of Global Underwater Explorer divers. This is a great one to dive with DPVs to get further along and see some of the other cenotes that are only accessible from underwater.

## REGINA AREA

Cenote Regina was named after the landowners' daughter when explorers began diving and exploring this cenote. Unfortunately, the principal entrance is now closed to divers, but two other (close) entrances grant divers access to this amazing section of cave. The cave was explored by various divers over the years - Alex and Torsten Kampe, Robbie Schmittner, Nadia Berni and David Seif all contributed, as well as divers from Mexico Cave Exploration Project (MCEP). The cave here drops to a deeper, 30m level, making it unusually deep for Mexico. This deep saltwater section is an amazing dive, with cool looking decorations, as well as very different coloration of the floors, walls and ceilings. Recent exploration in 2019-2020 by a team of divers from ProTec Dive Centers led to the connection of this system with OBH.

## SPECTACULAR OPPORTUNITIES

The cave systems of Mexico, particularly Ox Bel Ha, offer an unparalleled underwater wonderland for cave divers. Spanning over 500 kilometers of mapped passages and still growing, Ox Bel Ha stands as a testament to the dedication and skill of generations of explorers. Its complexity and beauty are mirrored in its many cenote entrances like Naranjal, Corazon del Paraiso and Yax Chen, each with its unique history, challenges and breathtaking formations. Beyond their allure as diving destinations, these caves hold significant archaeological and ecological importance, offering glimpses into ancient human activity and providing critical insights into the Yucatán's aquifer systems. These intricate subterranean networks are not just marvels of natural architecture, but also vital ecosystems and repositories of history.

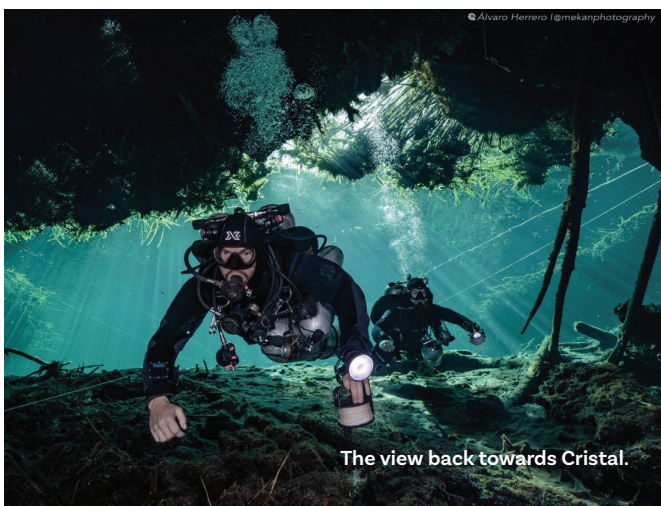




Mayan Blue develops a unique appearance after rain.

## ABOUT THE AUTHOR

Skanda Coffield-Feith is a cave and rebreather diving instructor and cave explorer. He is based in Tulum, Mexico, a 10-minute drive from the world's longest underwater cave systems. Originally from Melbourne, Australia, he learned to dive in Koh Tao, Thailand in 2006 and was immediately hooked. He spent some years diving in some of the best locations around South East Asia as a recreational diver, before discovering that he could dive in Melbourne, where he was introduced to technical diving and heard about cave diving. During a trip to Mount Gambier, he was introduced to the famous Australian caves and became a cave diver. Skanda now spends most of his time teaching at ProTec Dive Centers Tulum. His focus is on training divers in cave diving specialty courses like cave survey and stage cave, as well as teaching the KISS Sidewinder Closed Circuit Rebreather. When he is not teaching, he is out in the jungle exploring new cave systems. While predominantly involved in remarkable exploration projects in Mexico, he has been a part of cave exploration expeditions in Australia. Follow him on instagram [@skandacophield](https://www.instagram.com/skandacophield) or his blog at [skandasdivingadventures.wordpress.com](https://skandasdivingadventures.wordpress.com)



The view back towards Cristal.



The Mayan Blue F Tunnel.





The ASF conference display showcased gear from another era.

## AUSTRALIAN SPELEOLOGICAL FEDERATION LIBRARY / MUSEUM

● By Rod O'Brien (CDAA #2290)

**The Australian Speleological Federation (ASF) is Australia's national governing body in all things related to caves, karst and their conservation. It was formed by the caving clubs of Australia in 1956 with the first bi-annual conference held in Adelaide December 1956. The ASF website is located at [caves.org.au](http://caves.org.au). I am currently the Cave Diving Commissioner and Deputy Librarian of the ASF.**

Since its formation, the ASF library has been steadily collecting material such as books, journals, papers by the many science fields involved, maps, slides and photographs, memorabilia and items relating to the sport of caving, which includes cave diving. The library website is located at [asflib.net](http://asflib.net).

The museum section of the ASF library is steadily growing with retired cavers and divers donating their equipment as they clean out their sheds. We now have diving equipment, tanks and regulators dating back as far as the 1950s.

Cave diving is of major importance to the ASF. Divers across Australia are exploring and mapping underground river systems, sinkholes and the aquifers of northern Australia and the Nullarbor Plain. It began in Dec 1952 (O'Brien 2015, 2018) when divers started the exploration of the underground river at Jenolan Caves, NSW. During the course of the project, they teamed up with the Underwater Explorers Club (UEC) during 1953-1956 then later with the Underwater Research Group (URG) Sydney during 1956-1961. They used a variety of early

regulators including the Lawson Lung (Brown 2018), (Gregory 2014, 2015), Dawson Lung (Lawler 2009), Porpoise (Brown et al. 2009) and Sea Hornet (Brown 2020). Several home-made units were also used including a WWII gas mask. In May 1958 the first cave dive in Victoria was conducted by members of the Victorian Sub Aqua Group (VSAG) and in March 1959 VSAG President Bill Kunert travelled to Tasmania and with two local divers conducted Tasmania's first cave dive (O'Brien et al. 2023). In June 1961 South Australian cave divers along with the VSAG divers started diving the sinkholes at Mount Gambier, South Australia (Horne 2023), (Robertson 1997), (Beard 1961).

The ASF library has been setting up a display of rare books, memorabilia and museum pieces at the ASF bi-annual conferences. In January this year the 33rd ASF Bi-annual Conference was held at Buchan, Victoria. This year there were several presentations centered on cave diving in NSW and Victoria and Stephen Fordyce conducted a cave diving display in the AE Lind swimming pool at the Buchan Caves Reserve.



A short YouTube video of this dive is being made. So, I decided to put together a diving themed museum display containing some of the historical diving equipment the ASF library/museum held. There were cylinders, regulators, BCDs, helmets and lights, cameras and an assortment of other bits and pieces. Other Historical Diving Society (HDS) members kindly loaned me some of their collection to add to the display that related to cave diving.

The display was very well received with people viewing the items and reading the explanation sheets that were available. I was kept busy all week with people asking me questions about the equipment.

I would like to sincerely thank HDS members Mel Brown for the loan of his Lawson Lung, Tony Gregory for the loan of his Porpoise Single Tank with Lawson Lung and Des Williams who went out of his way to supply me with Peter Robertson's home-made regulator (Williams 2019).

For people who would like to donate items to the ASF library/museum please feel free to contact the **ASF librarian Cathi Humprey-Hood** at **asf.caves.library@gmail.com**.



ASF librarian Cathi Humprey-Hood provides an update at the 33rd ASF Bi-annual Conference.



Dive gear of the past on show at the ASF conference.

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# CDAA INSTRUCTORS

## NAME

| BASIC CAVE | CAVE | ADV. CAVE |
|------------|------|-----------|
|------------|------|-----------|

## NEW SOUTH WALES



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## NAME

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|------------|------|-----------|

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|     |     |     |
|-----|-----|-----|
| YES | YES | YES |
|-----|-----|-----|

# EMERGENCY PLANNING INFORMATION

## TIPS FOR EFFECTIVE EMERGENCY MANAGEMENT

- Always inform someone (who is not part of your dive team) of your dive plan
- Be prepared, and ensure you can provide critical information (such as your location) to emergency services when required
- Always plan your dive and dive your plan!
- Be trained to administer First Aid and CPR. It's better to have it and not need it, than need it and not know what to do!

## ACCIDENT/INCIDENT RESPONSE:

In the event of an incident or accident, CDAA members are to:

1. Assist the person or persons injured.
2. Contact emergency services (if needed) and provide clear and accurate information:
  - a. **WHAT** is the emergency?
  - b. **WHERE** is the emergency? Provide relevant information – street address, GPS coordinates, nearby landmarks.
  - c. **HOW** do emergency services access the site? If possible, direct another member to meet emergency services at the road or a nearby intersection and direct them towards the emergency. Provide the **NAME** of the injured person/s.
  - d. Provide **YOUR NAME** and contact details.
3. While you are waiting for emergency services record as much relevant information as possible, including times, names and contact details and events leading to incident.
4. Contact the CDAA National Director and/or the CDAA Site Director as soon as possible

## MISSING/OVERDUE DIVER:

In the event that a diver has not returned to the surface by the expected time, it is important that members act quickly as time is of the essence. As a guide, if a diver is 30 MINUTES or more over their expected run-time, members are advised to:

1. Contact the CDAA Search & Recovery (SAR) Officer. In the event that the SAR Officer cannot be contacted, call the National Director, or Site Director. Follow the directions provided by the SAR Officer or relevant Director.
2. Provide as much information as you can – names of the missing divers, summary of the dive plan, time the divers entered the water, equipment configuration used, expected run time, time overdue.
3. Establish an appropriate course of action. Consideration should be given to the dive plan, extent of penetration and gas reserves of the missing/overdue divers. Are there are other divers on site (or nearby) who may be able to assist with an emergency search. **Note: a search should ONLY be considered if divers available are suitably experienced, equipped, and have sufficient (additional) gas to undertake a search and provide assistance.**
4. If no other divers are available to conduct a search or the missing/overdue divers are not located and have not otherwise returned within the timeframe decided, enact the **ACCIDENT/INCIDENT RESPONSE** procedures listed above.

## DECEASED DIVER:

1. If a diver is found to be deceased within the cave, do not disturb the scene. If possible, try to note down pertinent information - location, position, remaining gas, computer runtime, then return to the surface as soon as possible.
2. Contact the CDAA National Director and the CDAA Search & Recovery (SAR) Officer immediately. The SAR Officer will liaise with the relevant authorities as required.

**NOTE: Members are advised not to make any statements regarding incidents or accidents to members of the public, to landowners, to the media, or via any other platform/media. Please direct all associated enquiries to the National Director for comment.**

## EMERGENCY CONTACT DETAILS

|                                |                     |  |
|--------------------------------|---------------------|--|
| Police, Ambulance, Fire        | 000 or 112 (mobile) | CDAA National Director – Grant Pearce 0438 833 103 |
| State Emergency Services       | 132 500             | CDAA Site Director – Kelvin Ball 0428 842 259      |
| Mt Gambier Hospital            | 8721 1200           | CDAA SAR Officer – Richard Harris 0417 177 830     |
| Divers Emergency Service (DAN) | 1800 088 200        | CDAA SAR Officer – Phillip Croker 0423 393 347     |



THIS IS JUST NEXT DOOR ...



◀○○◻

# CAVE-DIVING

I N D O N E S I A

Picture: Alex Dawson

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