

Beyond the Sump Expedition 2018

Return to the Cueva de la Peña Colorada

Andreas Klocker with input from Adam Haydock, Alejandra Mendoza, Chris Jewell, Gilly Elor, Matt Vinzant, Teddy Garlock and Zeb Lilly

BACKGROUND

Sistema Huautla, located in the Mexican state of Oaxaca, is one of the world's most spectacular deep caves.

It is currently 1560 m deep and about 85 km long. It has over 20 entrances, all of which collect large amounts of rainwater during the wet season. The most downstream part of this cave system is a huge sump — a sump being a fully submerged part of the cave which can only be explored with dive gear — known as Sump 9 or 'The Mother of all Sumps' that had been discovered on an expedition led by Bill Stone in 1994 (Stone and am Ende 1995; Stone *et al.* 2002).

It was only in 2013 that cavers returned to Sump 9 on a British expedition organised by Chris Jewell. On that trip Jason Mallinson and Chris Jewell pushed Sump 9 to a depth of 81 m at 440 m penetration, with the underwater tunnel barrelling off to greater depths (Jewell 2013).

One of the great mysteries of Sistema Huautla is its connection to the active resurgence in the Santo Domingo canyon some 10 km away. This resurgence has been confirmed by dye trace and has been the subject of several expeditions, each of which has increased the known length of the cave and reduced the gap from the end of the line in Sistema Huautla's Sump 9.

In 2001, Brits Jason Mallinson and Rick Stanton explored and surveyed the underwater resurgence for just over one kilometre to an air bell where a passage was seen heading off 10 m above water level, but the upstream continuation of the underwater river remained a mystery (Shade and Stone 2002).

In 2016, Andreas Klocker and Zeb Lilly started Beyond the Sump Expeditions with the goal of continuing Bill Stone's efforts to connect Sistema Huautla with its resurgence. In both 2016 and 2017, the main goal of the expedition was to continue exploration in the Huautla Resurgence, and find the way on from where Jason Mallinson got to in 2001.



While both these expeditions significantly increased the length of this cave, finding some of the most spectacular cave passages in this region, due to the complex nature of this cave the main way on, following the underwater continuation towards Sistema Huautla remained elusive (Klocker 2017, 2018). As a consequence, the objectives for the 2018 expedition focused on the Cueva de la Peña Colorada, which is hypothesised to be the overflow resurgence to Sistema Huautla and hence could provide a short cut connecting into Sistema Huautla between the known upstream system and its resurgence.

THE 1984 PEÑA COLORADA EXPEDITION

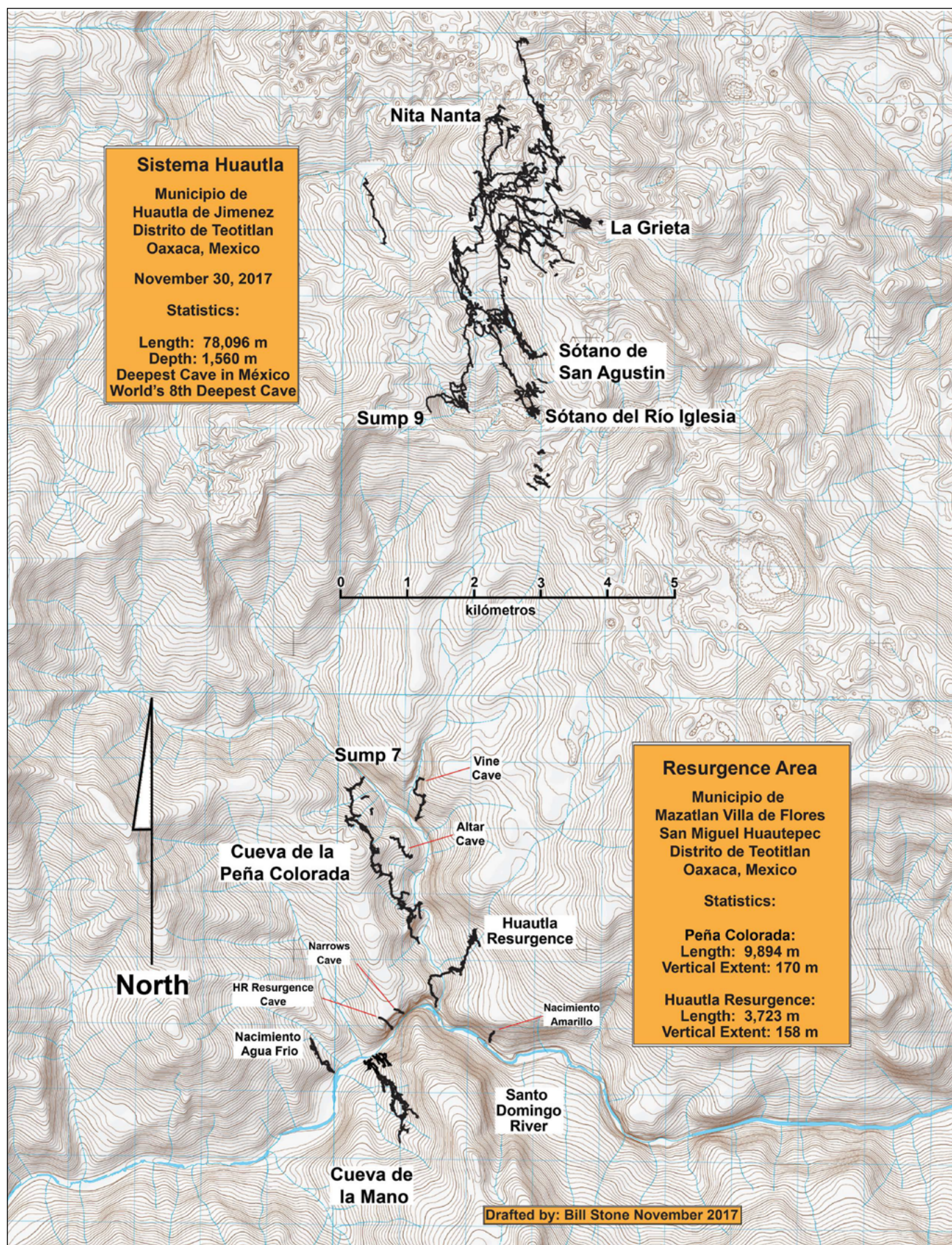
Thirty-four years ago, in 1984, a team of cave explorers led by Dr. Bill Stone of the US Deep Caving Team explored a remote resurgence cave in the Mexican state of Oaxaca, known as the Cueva de la Peña Colorada (Stone 1984). Over three months, the team successfully explored roughly 5 km into the mountain, requiring them to tackle several sumps and establish the first ever subterranean camps beyond sumps,

requiring the team to transport all camping gear through these sumps, until they were finally stopped by Sump 7.

Sump 7 started just beyond Camp 2 at the bottom of a 55 m vertical drop, with no place at water level where the cave explorers could put on their dive gear. Hence, they had to descend this vertical drop with dive gear attached to them.

Nevertheless, after an epic effort to get into the sump, the team finally managed several exploration dives. The sump quickly reached a depth of over 50 m, but due to the divers using air rather than gas mixes including helium which is commonly used for modern day deep diving, and due to the amount of tanks necessary to dive at such depths on open circuit, these cave explorers quickly hit their logistical limits and were forced to return.

The divers reported a large passage continuing north underwater, leading them to believe that this cave might connect to Sistema Huautla. Since then the hypothesis had been that the Cueva de la Peña Colorada is an overflow resurgence to Sistema Huautla which is only active during the wet season. Nevertheless, this hypothesis had

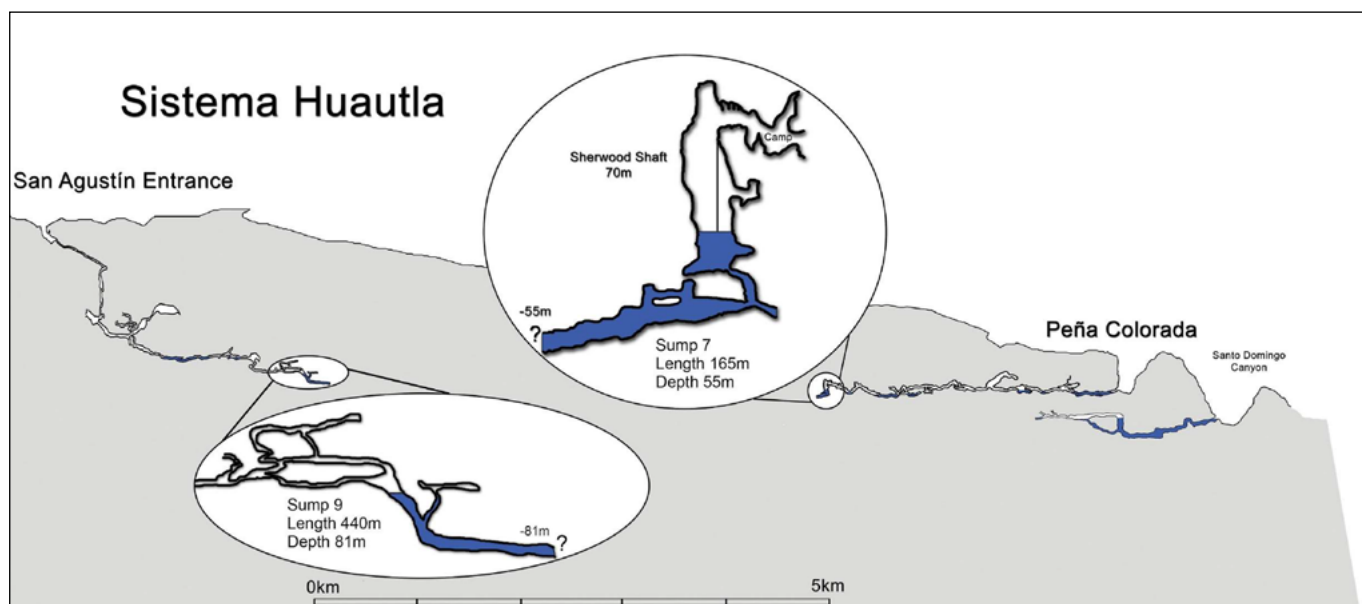


never been proven using dye tracing. The hope for 2018 was that, after not finding the way on underwater in the Huautla Resurgence in 2016 and 2017, the Cueva de la Peña Colorada might be a short cut into the

elusive underground river between Sistema Huautla and its resurgence.

The 1984 expedition was an immense logistical challenge. Two hundred Mazatecs were hired, along with 65 burros to

transport the eight tonnes of provisions, camping, caving, and diving gear down into the Peña Colorada canyon. Using the team's supply of 72 light-weight composite dive tanks, two divers finally reached Sump



A schematic showing the main underwater leads which are thought to connect Sistem Huautla with its resurgence.
 The left inset shows Sistema Huautla reduced to the quickest way to reach Sump 9 from the surface via the Fools Day extension in San Agustín.
 The right inset shows both Sump 7 in the Cueva de la Peña Colorado and the Huautla Resurgence.

7 with only five tanks, since all other tanks were needed to get everyone through the first six sumps to Camp 2, the second subterranean camp located just above Sump 7.

It was clear to Bill Stone that new technology was needed to overcome these logistical challenges to explore further, and it was after this trip that he started to develop the now famous CIS-Lunar rebreather. Rebreathers are complex pieces of dive kit (at that time only available to the military) which recycle only the oxygen metabolised by the diver and extract the CO₂. They are thus much more efficient than the open circuit dive gear used on the 1984 expedition.

Nevertheless, Bill Stone never returned to the Peña Colorado, and, until 2018, 34 years later, no other team stood up to the immense challenge of exploring this remote sump. Now, in 2018, the plan was to return to Sump 7 and continue exploration towards Sistema Huautla.

ASSEMBLING THE TEAM

One of the big challenges of cave exploration in a cave such as the Cueva de la Peña Colorado is to put together a team with the right skill set to push a remote sump, such as Sump 7. In particular, for such a cave, a large team of support divers was necessary to put a very small team of exploration divers into the final sump. This team would need to be made up of:

1) Support divers who have extensive experience in both dry caving and cave diving. They had to be able to deal with techniques used to ascend and descend ropes on vertical drops in dry parts of the cave, have plenty of endurance to keep hauling gear down a 700 m deep canyon, 5 km into a cave, on trips which would sometimes last

more than a week underground — definitely a very rare species of cave explorer. The need for a large team of support divers with cave diving experience is unique to this particular cave, since not many caves have passages beyond sumps as extensive as the Cueva de la Peña Colorado and many other caves can make use of a large team of dry cavers to help support the dive team.

2) Push divers, who in addition to the requirements of the support divers, are capable of doing long and deep exploration dives. Survey data shows that Sump 7 in the Cueva de la Peña Colorado and Sump 9 in Sistema Huautla are at the same vertical level within survey errors, pointing towards the possibility of Sump 7 being very long and deep.

3) People who can support the team on the surface, with both local politics, the relationship with locals, and translating.

Luckily, the full crew of the 2017 expedition to the Huautla Resurgence returned in 2018, meaning several people on the trip with previous experience of caving in this region could add to the trip. In addition, a large group of cavers from the UK and Ireland came along, most of whom are part of the UK's Cave Diving Group (CDG) and have extensive experience in working beyond sumps. From the other side of the Atlantic, several cave divers from Florida joined; they were very experienced in diving Florida's long, deep springs, but quite new to dry caving techniques. This team was topped off by several strong cavers from Canada and Poland. As in previous years, this expedition could not have happened with the help of Alejandra Mendoza, who dealt with local politics and the locals for us, assisted by Alma, a schoolteacher in

Huautla, and Fernando Hernandez, a Mexican doing his PhD in the US.

The members of the team included: Adam Haydock (USA), Adam Walker (CAN), Alejandra Mendoza (MEX), Andreas Klocker (AUS/AUT), Andrew Atkinson (UK), Charlie Roberson (USA), Chris Jewell (UK), Connor Roe (UK), Dane Motty (USA), Dave Watts (UK), Fernando Hernandez (MEX), Gareth Davies (UK), Gilly Elor (ISR/USA), Jim Warny (IRE), Josh Brackley (UK), Matt Jenkinson (UK), Katie Graham (CAN), Kyle Moschell (USA), Laura Trowbridge (UK), Matt Vinzant (USA), Maxwell Fisher (UK), Michael Waterworth (UK), Mirek Kopertowski (POL), Teddy Garlock (USA), Tomasz Kochanowicz (POL), and Zeb Lilly (USA).

DIVE GEAR

From old trip reports of the 1984 expedition and several conversations Zeb and Andreas had with Bill Stone, it was clear that just organising all the gear needed for a serious dive attempt in Sump 7 would be an epic challenge. During the 1984 expedition the reason for the team to retreat was that they hit the logistical limits of the dive gear available at the time, and to be successful, this expedition needed to overcome the challenges which stopped the 1984 expedition.

The biggest change to the dive gear from 1984 was the use of rebreathers, which would allow for long and deep exploration dives without the need for an unrealistically large amount of diving cylinders. These rebreathers needed to be lightweight and easy to repair with few tools far into the cave. While some of the support divers used open-circuit dive gear, most divers on



Some of the team relaxing at Camp 1

LOCAL POLITICS

by Alejandra Mendoza

The first time Andreas and Alex arrived at Loma Grande, the agent of the village, Rafael Carrera, agreed with the expedition. He would allow the divers to explore the Peña Colorada and offered them a place to stay in his house, with the only condition being to get written permission from the municipal president of Mazatlán Villa de Flores, Misael Martínez.

Misael Martínez is a young man with an open mind, a quality hard to find in small Mexican villages. President Misael agreed with the expedition as well, but he needed a reunion to communicate it to the other members of the cabinet. Unfortunately, many of them did not agree with the project and on purpose caused a delay in the writing of the permission.

A spontaneous trip to Oaxaca City, about 7 hours away, was made to hurry the president. He had to call Mazatlán to demand the realisation of the document for Andreas and Alex to receive it as soon as possible. But secretary Celso Vaquero and education alderman Artemio de la Cruz disobeyed Misael and never produced the paperwork.

When the first group of divers arrived, the team had not received the document. Alex had to return to Mexico City, leaving the team alone, but luckily one day after the group of divers arrived Misael sent the permission and the divers started to carry all the equipment into the cave.

Around two weeks later, a group of native people arrived at Rafael's house with sticks and machetes, arguing that the foreigners were there to kidnap their children, to take possession of their land and steal the gold inside the cave. Alex had to return to Loma Grande to try to fix this tension between the locals and the team, but these issues turned bigger and bigger.

Furthermore, some misunderstandings between the locals over their heritage in Loma Grande, with the locals believing that white people are very rich and would give Rafael lots of money, making these locals very jealous. They started a coup leading to a new agent taking over, who took the agency and acted like authority in some official events that took place. Rafael's family ended up being isolated from the rest of the town.

As president, Misael must travel to Oaxaca City once or twice a week, in addition to the visits to the agencies conforming the municipality, so each time the team went to Mazatlán, the president was not there, and the secretary was very disagreeable with Rafael, blaming him for all the things gone wrong. It was a communication issue with

this trip used small side-mounted or chest-mounted rebreathers, either some of the cutting-edge rebreathers produced by the company KISS Rebreathers, or home-built units such as are common with the CDG in the UK. All of these had in common that they were manual rebreathers, making them much easier to repair in remote situations since they do not rely on complex electronics.

Similar to the 1984 expedition, composite tanks were used which are very lightweight, but on the downside need much weight to sink when diving. The big advantage of these tanks was that only the tanks needed to come out of the cave to refill while the lead weights could stay in the cave.

And while the tanks used to get to Sump 7 were all filled with air or Nitrox, the tanks used in Sump 7 were filled with Trimix, i.e. gas mixes including helium, for divers to be able to maintain a clear head when diving at 50 m depth and beyond.

To facilitate gearing up for Sump 7 and to avoid having to climb up a 55 m vertical drop above the sump after a big dive, a platform was used, similar to the portaledge climbers use to sleep on big walls. In case Sump 7 turned out to be very long and/or deep, lithium-powered scooters and a decompression habitat were kept in the field house, ready to go into the cave.

TRAVEL

The trip started when Zeb, who lives in Virginia, after months of preparing gear at his place, finally started the drive in his long wheelbase Ford F350 full of gear towards Florida. At a similar time Andreas left his home in Hobart, Australia, to fly into Jacksonville where Zeb picked him up from the airport.

In Florida they met up with Matt Vinzant, a highly experienced Florida cave diver who was going to join the expedition as exploration diver, and Gilly Elor, one of the

support divers. Over a few days they did several practice dives in Florida's amazing springs and prepared over 70 4-litre Nalgene bottles with cave food to be used in the two underground camps for the large expedition team on the way to Sump 7.

Two days after leaving Florida, Andreas, Zeb and Gilly arrived at the Mexican border, a bit later than planned due to a minor mechanical hiccup when the fuel pump of the van, the second expedition vehicle (known as the 'Soccer Mum Special'), failed.

At the border they met Alejandra 'Alex' Mendoza who helped with the border formalities, since none of the others spoke fluent Spanish. After the border crossing the next stop was Monterrey where Zeb and Gilly flew back to the US to work in their day jobs for a few more weeks before joining the expedition while Alex, Alexander Buess (a German cave diver living in Mexico) and Andreas continued driving the two vehicles south. After a couple hours out of Monterrey the head gasket of the van suddenly decided that it needed replacement. After a stressful evening finding a towtruck, a mechanic, and the next morning a rental car big enough to carry all the dive gear we had in the van, the team was finally on the road again.

Annoyingly, though, Zeb would now have to pick up the van on his trip down south. Nevertheless, after two days of driving, the team finally made it to Huautla.

But the car trouble was not over and upon entering Huautla in the F350 one of the intercooler hoses popped off and a brake line developed a leak. While Andreas could reattach the hose with Zeb's instructions, the brake line needed to be ordered by the local mechanic, which left the team without a functioning vehicle since the rental car had to return with Alex Buess the next day. Luckily, Alma could organise an empty classroom in Huautla where the gear could be stored until the vehicle issues were sorted.

people in the town, because he never did a reunion to inform others about the foreigners' plans. As natives were very introverted, they never joined activities in town and nobody attended the local meetings, which is why Rafael decided not to hold any meetings.

Secretary Celso promised to go to Loma Grande to calm down the people, but he never arrived. As Alex had to return to Mexico City again, Fernando, who was there doing hydrological studies, could stay longer to try to get an agreement between locals and foreigners, but that did not happen and the locals gave the foreigners just a couple of days to get out with all their equipment. Since Fernando moved to Huautla leaving the team without a native Spanish speaker, the atmosphere in the team turned delicate and stressful.

Finally, after a couple of days, President Misael arrived at Loma Grande with all the authorities and a lot of police. He talked with the people and ordered them to leave the divers alone so they could finish their exploration.

SETTING UP THE CAVE

After a fortnight of time spent driving and dealing with politics, the first large group of cavers, mainly Brits at this stage, arrived in Huautla via bus from Mexico City.

Since the written permission to access the cave was a bit late, a day was spent in Huautla shopping and fixing the rear window of the truck, which did not survive the long trip through Mexico.

The next day, with the permission in hand, the team moved into the accommodation in Loma Grande, unloaded all the gear from the trucks and stored it in the very limited space available to us in one small building.

Soon after, they were ready to start mov-



Andreas Klocker sorting gear at Sump 1

ing large amounts of gear towards Sump 7.

To access the cave, it was first necessary to descend 700 vertical metres down the Peña Colorada canyon with all of the gear, transport the gear 5 km into the cave through five sumps (Sump 1 could be bypassed via the canyon entrance to the Peña Colorada found by Bill Stone) to Camp 2, just above Sump 7. The hike from the field house in Loma Grande took about two hours once the trail became familiar, and for about two thirds of the descent down the canyon it was possible to use horses owned by locals to carry most of the load.

This canyon trip, steep and with extreme heat, was probably one of the main challenges for most expedition members. On top of that, it was known from previous expeditioners that the canyon is home to many poisonous snakes, in particular the aggressive and deadly pit viper and so most hiking was done during daytime.

It was time to get gear into the cave and through the sumps. Both Connor Roe and Andreas started relining the sumps for the others to follow. Luckily, Sump 2 was very short — just too long to dive it holding your breath — and then it was necessary to

carry all the gear over a huge pile of large boulders before reaching Sump 3.

While the cave map showed that this sump should be relatively straightforward, with visibility quite a lot worse than anticipated from old reports, two dives were needed to reline this sump. The next day Chris and Connor returned and managed to find the way on. On the far side of the sump they had to climb about 15 m up a steep climb and rig a rope so that the team following could safely get up this vertical drop, hauling large amounts of gear.

Chris, Connor and several others then continued on with the plan to establish Camp 1. Unfortunately they were stopped by surprisingly high water levels, which turned the Grand Lagoon — which in 1984 was a swim with sufficient air space — into a short dive. Since it was late in the day, they decided to create a temporary camp before the lagoon.

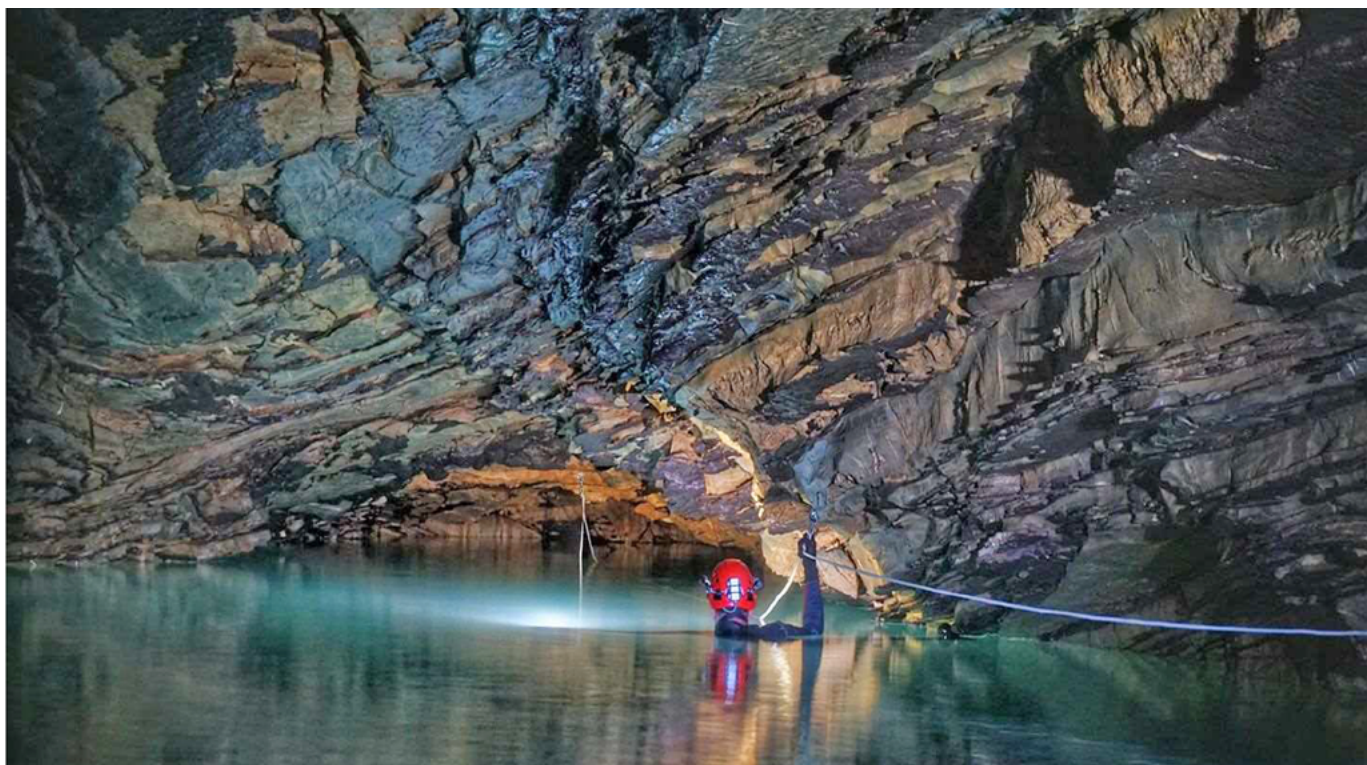
On the next trip Welshman Gareth Davies, Brit Andrew Atkinson, Connor and Andreas entered the cave and pushed through the Grand Lagoon to establish Camp 1 on its other side. The day after establishing Camp 1 everyone helped carry Andreas' dive gear, including his rebreather, to Sump 4 where he then started to reline Sumps 4 and 5, which were separated by a short lake. Surprisingly, on this dive he found enough remnant pieces of dive line from the 1984 expedition which acted as breadcrumbs to find his way through this complex sump in one go.

After relining, Andrew and Andreas continued through Sumps 4 and 5, shuttling large amounts of gear with the goal of establishing Camp 2. This turned out to be a very long day, and since Andrew and Andreas became increasingly tired they tried to find a temporary camp spot on the way to Camp 2.

But the cave passage to Camp 2 was either wet, had loud waterfalls close by or was unsuitable for a camp in some other



Dry tubes loaded for the trip down the canyon



MICHAEL WATERWORTH

The Grand Lagoon

way. They pushed on and finally established Camp 2 very close to Sump 7, where they put up several hammocks since there was no flat ground to sleep on.

In the meantime, the others spent several days hauling gear from Sump 3 to Camp 1 and over the long stretch from Camp 1 to Sump 4.

THE PUSH

After Andrew and Andreas exited the cave it still took almost a week for enough gear to arrive at Sump 7, including the platforms used to gear up for the dive. Now, 34 years after the initial exploration, it was finally time to put the first two divers, Chris and Connor, into Sump 7.

Chris describes the first dives in Sump 7:

'It is hard to describe the feeling of finally diving a sump you've dreamt about for years. Excitement mixes with nervousness and you know it has taken a lot of effort to get to this point – now you need to not mess it up!

'With Connor laying the line, I followed him across to the far wall of the spacious shaft. With visibility around 5 m it should have been easy to navigate but the scale of the underwater cave still meant our lights often failed to reach the walls. After picking our way through a boulder choke we descended to 33 m and entered a large horizontal passage which matched the description of the previous explorers.

'Following this passage steadily down we noted several alternative passages but instinctively we headed deeper along the largest tunnel. At the lip of a small pot,

we peered down into the depths before descending to a rock and gravel floor at 51.5 m depth. A little further ahead, however, the large passage stopped abruptly in a pile of well-consolidated boulders jammed against each other.

'We couldn't believe it — the cave couldn't end like this; surely we had missed something. Retracing our steps while decompressing, we scoured the walls for the missing way on but nothing could be found except the previously noted side passages which we decided to leave for the next day.'

This was bad news for the expedition. The long hoped-for connection between the Cueva de la Peña Colorada and Sistema Huautla suddenly fell to pieces. Nevertheless, a week later Zeb and Andreas planned to head back to Sump 7 to give it another go. Maybe Chris and Connor had just missed the way on.

Supported by Katie Graham and Max Fisher, Andreas and Zeb finally headed back into the cave a few days later. After spending a night at Camp 1, they reached Sump 4 where they were surprised by much higher and still rising water levels, with Andreas' rebreather, placed on the last trip about 5 m above the sump, now floating in the sump pool. After rescuing the rebreather they headed back to Camp 1 and on the following day decided to go back to the surface to assess the situation.

A few days later Andreas and Mirek entered the cave to meet Tomasz at Sump 3 and then spend a night at Camp 1 before continuing to Camp 2. The day after, Zeb, Gilly and Charlie entered and followed the

first team into the cave. Due to the limited number of hammocks in Camp 2, only Zeb continued to Camp 2 a day later to join Andreas for further exploration dives in Sump 7. As the time for Jim Warney from Ireland and Adam Haydock to return home came, they both left Loma Grande to spend a night in Huautla.

'Jim and I were having beers in Huautla and as we watched the rain start to downpour. I mentioned to Jim that rainfall occurs more at this elevation and it should stop soon, but as we continued to walk through town and talk with some of the cavers from the nearby Cheve expedition led by Bill Stone, the rain kept up coming down and streams of water ran down the sloped streets of Huautla.

'I mentioned to Jim that this was not good. There is a lot of water coming down and these streets are cascading with water. All these towns and hills shed this water into the caves beneath us and Sistema Huautla is a major drainage for the watershed. I became a bit concerned but I didn't imagine it would later cause a huge problem, as it did later on.'

While Jim and Adam were observing the downpour on the surface, Zeb, Andreas and several of our support crew were busy getting ready for another go at Sump 7 to try to find a way around the collapsed pile of boulders which stopped Chris and Connor on their attempt to explore this sump. At this time there was no way to communicate between the surface and those deep in the cave and thus we had no idea about the change in the weather.

After the several days it took Zeb and Andreas to get them and their gear to Sump 7, we were finally at the point where we did final preparations on our KISS Sidewinder rebreathers before sliding off the platform into the sump. The visibility above the restriction, which stretches between ~20-30 metres depth, was less than 2 m, but luckily it improved to ~7 m below. We followed Chris and Connor's line and tried to find a way on from there, but sadly without success.

After a 1.5 hour surface interval on the platform, Andreas decided to give it one more try, this time solo since Zeb had some issues with his gear. He checked out everything which looked like it could be a way on, surveyed the deepest part of the cave which Chris and Connor could not do on their dive due to a lack of time and finally checked one more remaining lead which just reconnected in the passage we already knew. Sadly though, Sump 7 was a dead end.

THE FLOOD

By this time, eight days after leaving the surface, Mirek Kopertowski and Andreas were seriously overdue for some sunshine and a cold beer. There were six people still in the cave. Dane Motty, Gilly, and Mirek were shuttling gear through Sump 3, and Matt and Zeb were assisting them at the vertical drop over Sump 3.

Andreas was lugging gear in an area known as the Grand Lagoon deep inside the system when the silence was suddenly broken by a deafening noise as if giant water turbines had suddenly been turned on. The only explanation for the noise was that an unexpected downpour was rapidly fill-

ing the cave system we had been exploring. Andreas quickly ran to the others where Zeb was just coming up a rope hanging down the vertical drop above the sump, who immediately told him that the water level in Sump 3 had just come up by almost a metre. Putting those two bits of information together, both the thundering noise at the Grand Lagoon and the fast-rising water in Sump 3, it was clear to Andreas that they were in big trouble.

Andreas' face must have looked worried and Zeb, who has probably spent more time with Andreas in very remote cave passages than anyone else, realised immediately that this was serious. Andreas decided to make a dash to safety, all six of us still in the cave, further into the cave to an area known as the Whacking Great Chamber, a cathedral-like space nearly a hundred metres high. If we could get there we would be safe from drowning, but the water was rising fast and in the narrow passage leading to the chamber was at its worst just 10 cm from the rock ceiling. Luckily Zeb decided to put a dive line through this low part of the cave, which would facilitate our escape later.

While we were safe from drowning in the Whacking Great Chamber, we were also a kilometre from the exit, with flooded parts of the cave separating us from both Camp 1 and the dive gear which was above Sump 3. Gilly Elor describes the time spent in-between the two flooded passages that trapped the team in the cave for 69 hours.

'We knew that in the Great Whacking Chamber we were safe from drowning, but as the water level continued to rise we began to speculate as to how long it will take to drop... or would it even drop? Could the high water level be the more normal state

of the Cueva de la Peña Colorada? What if it rained again?

'This isn't a cold cave, so we knew that even though all we had were wetsuits and Matt's space blanket, hypothermia was a negligible risk. However, the only food we had was four granola bars between the six of us. The only action we could take once trapped was to lie still in the dark, conserving energy and headlamp batteries while attempting to keep warm and hope that the water level would drop, which we knew was our only way out.

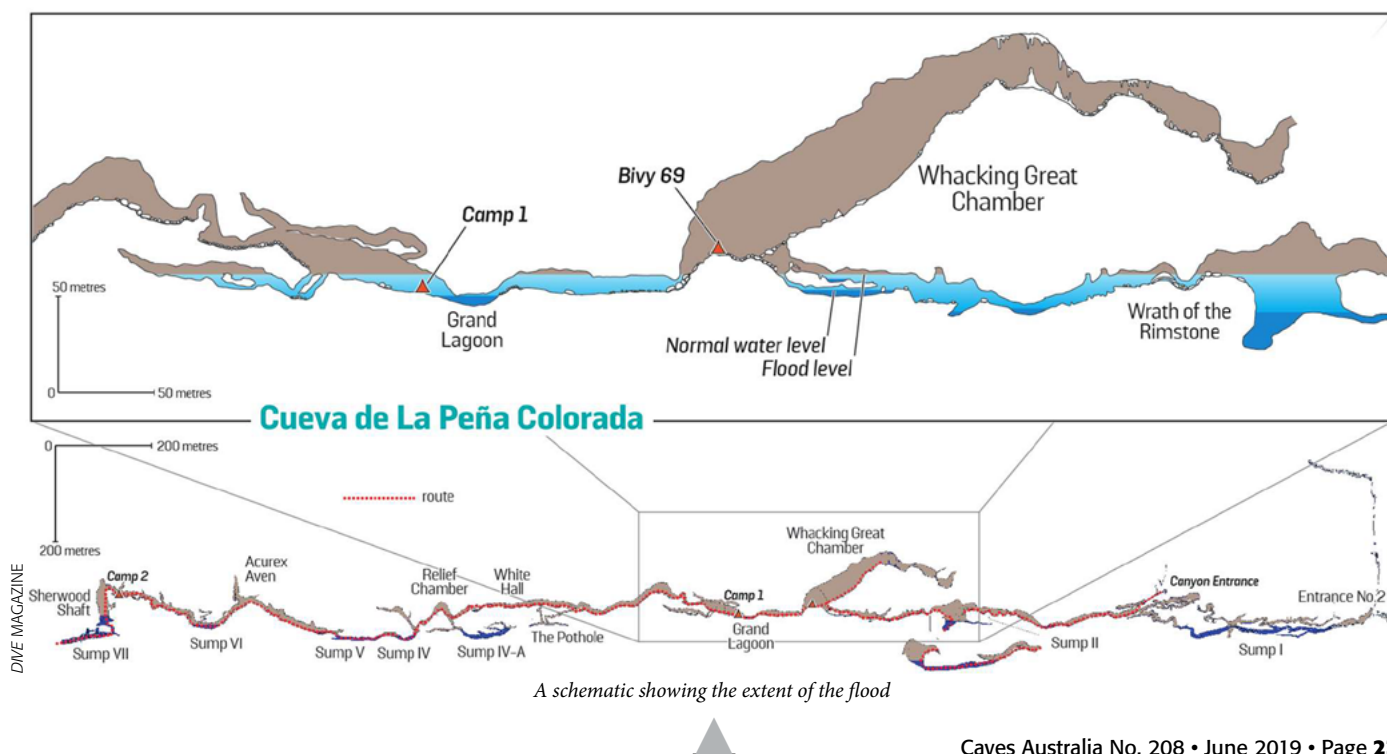
'That first night, as the water level continued to rise, nobody talked. What would we have talked about? Our outside lives. I think we were all contemplating the possibility that we may not get out. Eventually the water level began to slowly drop. We continued to huddle in the dark, listening to the sound of the gurgling water and coming up with theories justifying why every noise was a good sign.

'As time passed we also grew weaker from lack of food. After 48 hrs we split two out of the four bars six ways. I think the trick in this situation is not to think or fantasise about the food you can't have.'

In the meantime Teddy Garlock, one of the support divers from New York State, had arrived in Loma Grande. At this time nobody on the surface knew exactly what was going on in the cave.

Teddy recalls:

'The trip through Sump 2 was easy and I was soon on the far side carrying two composite cylinders and large amounts of gear to resupply the six cavers currently living in the cave. The passage between Sump 2 and Sump 3 requires a lot of scrambling through breakdown piles in some impres-



*Whacking Great Chamber*

sive cave. When I arrived I was a little taken aback by all of the Nalgens floating in the sump pool. Then I heard the unmistakable sound of a solenoid firing and saw Tomasz's rebreather floating amongst the debris. *Shit! Big problem.*

'My immediate concern was related to the dive guideline — missing somewhere in the flooded sump pool. My first attempt at finding the line involved wading in the shallow end with a mask and a light, hoping it was close. I soon added both of my tanks, tied in the only safety spool I had and began a lost-line search. My 25 m of line was quickly exhausted as I swept from side to side, finding dive gear strewn across the bottom but no guideline. Using a second reel which I found in the submerged gear, I finally found the guideline and tied in.

'After recovering all of the floating and most of the submerged gear, I filled a dry tube with Nalgens to resupply the others and set off alone into Sump 3. During the 15-minute traverse I noticed some mild narcosis which was notable since the passage was supposed to be ~20 m deep. After a while I arrived at the primary tie-off on the far side of Sump 3 which, much to my disappointment, was also under a significant amount of water. Having used all the spools I carried or could find, I was faced with an easy decision: surface and hope the tie-off had been placed in an area that would still have air space above it (and risk

losing the line) or turn around and head all the way back out. I made the obvious choice and turned back, leaving a dry tube with food and batteries tied off on the line.

'After waiting two days I returned to Sump 3 and noted the water had receded a good 8 m. I made the dive alone and extended the guideline on the far side, surfacing in a huge air chamber with six headlamps staring back at me. Mirek was the first one I spoke with and he gave me a brief synopsis of their experience: 'Three days we've been stuck in an air chamber, no food and only one space blanket. We're getting out right now'. With that Mirek disappeared into Sump 3 and began making his escape.'

THE AFTERMATH OF THE FLOOD *by Matt Vinzant*

The team of six spent 69 hours trapped in the Whacking Great Chamber and were beat down. In that time Matt, Dane and Zeb all suffered from intestinal issues.

The dive out of Sump 3 and the subsequent hike back to the field house was physically gruelling. The time had taken its toll on our bodies. Dane was suffering from exhaustion and dehydration, Andreas developed a fungal infection on his feet from wearing wet boots for days and Mirek could only drink one beer. The next day was a rest day and everyone agreed to spend it above ground, to enjoy the sun and spend time in Huautla eating real food and calling home.

There were no more cave camps after the flood; every day a team would make the round-trip hike to the cave to continue to derig.

Morale was low after Sump 7 did not go, along with the flood and mild medical maladies. The flood had isolated us from Camp 1 and much gear remained at camp and beyond. Five days after escaping the cave Zeb, Gilly, Teddy and Matt returned to conduct a recovery mission for all of the gear remaining beyond Sump 3. Zeb and Matt, assisted by Teddy and Gilly, carried their KISS rebreathers over the Whacking Great Chamber where they found the formerly dry passage leading to camp still full of water.

Visibility was poor. Matt led the way running the guideline along the ceiling. There was an air bell halfway before the passage submerged again where the Grand Lagoon once was. We named these two surprise sumps Sump 3a and 3b.

More than thirty 4-litre Nalgens, six sleeping pads, sleeping bags, stoves and personal kit were abandoned in camp. Zeb and Matt made it to Camp 1, which was still 3 m under water a week after the flood. Expecting to surface in a pool full of camp debris and Nalgens, they found nothing. Sand had moved, the water had risen and fallen and the gear disappeared with the water. 'It's all gone, flushed away, I suppose,' Zeb remarked.

Matt and Zeb continued to Sump 4 where cylinders and regulators remained. They noticed high watermarks and shifted sandbars.

The flood had overtopped the Relief Chamber at the top of Sump 4. They derigged the cave and recovered all of the equipment they could locate.

The next three days was spent ferrying gear through Sump 3 to Dive Base, and Dive Base before Sump 2 to the Horse Drop, which was the lowest point in the canyon the horses could get to. Thousands of kilograms of gear was returned to the field house, inventoried and loaded into the truck and van for the long drive back to the USA.

PHOTO DOCUMENTATION

by Adam Haydock

Photographing the Cueva de la Peña Colorada was a unique experience as the equipment required layers of protection from rough transport and the amphibious component provided challenges that continued to develop as the trip unfolded. Cave photography can become quite a task-oriented process and when delicate equipment is involved, one error or a faulty part can render cameras and light sources useless.

One of the more specialised challenges was to fit all the bulbs and equipment into a device that could keep everything dry. I was able to fit all of the sensitive electronic equipment into a dry tube designed for a dive scooter.

This provided a bit of streamlining while travelling through submerged passage. Furthermore, in order to make the tube neutrally buoyant, I had to strap an additional 20 lbs of weight and clip the tube onto the back of my sidemount.

Another challenge was to keep the bulbs from breaking due to the pressure or impacts that they might have encountered along the way. Thankfully, half the bulbs survived to make the photo of the Whacking Great Chamber a possibility. The other challenges were the typical battery and setup strategies that are encountered with cave photography, which was a non-issue.

I was glad to capture the cave from the main entrance back to Sump 4 as well as the surface of Loma Grande. It would have been good to get back to Sump 7 but thankfully photos were taken back there and video was made of the exploration dives beyond Sump 7.

Thank you to Katie Graham, Jim Warny, Connor Roe, Gareth Davies and Max Fisher for assisting with the photography and dealing with the exposed climbs in the Whacking Great Chamber.



JOSH BRATCHLEY

The divers' platforms at Sump 7

FUTURE PLANS

Since it is now believed that the Cueva de la Peña Colorada acts as an overflow to the canyon above, rather than as overflow to Sistema Huautla, to achieve the goal of connecting Sistema Huautla with its resurgence it will be necessary to either keep pushing the Huautla Resurgence where several leads remain, and find the continuation of the active streamway, or push Sump 9 which would involve a 100+ m dive in a very deep cave. While exploration in the Huautla Resurgence can be done with a relatively small team of 6-8 people, the exploration of Sump 9 would require a very long expedition with 40-60 dry cavers to support a handful of exploration divers in Sump 9.

In 2019, to allow for a bit of a change after several years pushing Sistema Huautla, the team will explore nearby resurgences, believed to drain the caves of a large karst plateau known as the Cerro Rabon. These systems could be up to 1500 m deep, but their resurgences have hardly been explored. Depending on local politics in Oaxaca, the objective the year after, in 2020, would be to organise a large expedition to continue the exploration of Sump 9. It will be epic.

SUPPORT

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For more information have a look at our web page, <https://www.beyondthesump.org>, and for regular updates on our future expeditions follow us on <https://www.facebook.com/CaveDive/>.

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