



Dachstein Caving Expedition 2019

Expedition Report



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Figure 1: Main expedition hut Camelot (A McLeod)

1 Introduction

There have been British caving expeditions to the Dachstein plateau, high in the Austrian Alps, for over 50 years. The Dachstein is a world-class caving destination with large amounts of both limestone and potential. The annual summer expedition attracts hardened expedition cavers, students and others from a large number of caving clubs and countries.

In 2018 the expedition made the historic connection between WUG Pot, high on the plateau, with the monster 112 km Hirlatzhöhle system at the bottom of the mountain. This increased the total depth in the Hirlatzhöhle to over 1500m, making it the 9th deepest cave in the world.

The expedition is run in conjunction with the local caving club, *Verein für Höhlenkunde Hallstatt-Obertraun*, who hold the permissions needed to explore caves in this part of Upper Austria. The expedition is based at the Wiesberghaus mountain hut, situated above Hallstatt. Without the assistance and cooperation of both, the expedition could not proceed in its current form.

The Dachstein is supported by a number of organizations and companies which have provided financial assistance or equipment. We are grateful for their support, which is described in section 2.

The expedition runs a pre-expedition training weekend. This was successful and well-attended, with 39 cavers teaching or learning surveying, underground survival skills and advanced SRT techniques. The weekend included a full-day rescue practice from a vertical cave entrance series. The Dachstein has focused on training newer cavers in expedition caving for many years and we are pleased to continue this. The expedition training weekend is described in section 3. Other preparation for the 2019 expedition is described in section 4.



Figure 2: Seilbahn arriving at the Wiesberghaus (P McCarron)

Recent years have discovered large amounts of new passage in WUG Pot, the main expedition cave. This culminated in the 2018 connection to the Hirlatzhöhle, but exploration continues to produce open leads, and so expedition members were keen to return. However, on arrival the cave entrance was found to be buried under several metres of snow! Not to be deterred, a day was spent digging out the cave entrance to allow access to the cave.

Exploration this year has focussed on the area close to the base of the entrance pitches and around the camp. Several resurveying trips mean that virtually the entire explored cave now has a modern digital survey (to 'survey' is to use instruments to draw a map of the cave). Meanwhile, a bolt climb at the end of a rising passage led to open walking passage which could provide a new easier entrance to the cave. WUG Pot is described in more detail in section 6.3.

Another expedition objective was to connect the cave PL2, which ends in a huge boulder chamber last reached in the 1980s, with PL2 inlet in WUG Pot. Surveys show that the two caves are now just tens of metres apart, and so an ambitious trip to reach the cave from both ends simultaneously was launched.



Figure 3: View towards Hallstatt on route up to the Wiesberghaus (P McCarron)

Much of PL2 has already been re-rigged in recent years, so it was hoped that it would be possible to reach the bottom in one trip this year. Unfortunately, the cavers in PL2 ran out of rope and time in a cave that was much wetter than recorded, and so were unable to reach the bottom.

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In WUG, cavers were able to reach what is probably the bottom of the boulders at the bottom of the PL2 inlet, but could find no way through the boulders and digging upwards proved impractical. This connection had to be left for another year. An account of the WUG side of this trip is given in section 6.3.3.

The Dachstein is often a caver's first expedition, and we encourage cavers with less experience to learn expedition skills to come to the Dachstein, find new caves, and then learn expedition skills such as bolting and surveying in these shallower caves.

Blood Moon, discovered in 2018, has been partly surveyed and explored by newer cavers this year with the hope that it will provide a higher entrance to WUG Pot. The connection to another cave, Burnie's Pot, has been surveyed. This cave is described in section 6.4.

Another cave called Tiger Trap has been similarly explored by a committed team of younger cavers. This cave required some enlargement before progress could be made, gaining a series of tight pitches in rifts. The cave has been surveyed, with 200 m of passage and a maximum depth of 57 m. This cave is described in section 6.5.

Finally, the 2017 cave Thundergasm has now been surveyed and pushed to 250m deep, primarily by new expedition cavers, and is now becoming a much more serious deep Alpine cave. This cave is described in section 6.6.

A report of expedition finances in the 2019 expedition year is included in section 7.

In summary, the 2019 Dachstein expedition achieved many of the expedition objectives and leaves next year's expedition with many targets and objectives.



Figure 4: View down valley below camp near sunset (P McCarron)

2 Sponsors and Grants

The 2019 expedition was fortunate to receive grants and sponsorship from a number of organizations and companies which are detailed below. The Dachstein is extremely grateful to all our sponsors and supporters.

In addition to the support detailed in the following sections, a group of visiting Austrians donated six new Vaude synthetic sleeping bags which will be put to good use deep in the cave setting up a new camp. We also received three used tackle sacks which are always useful. We are grateful for all donations, regardless of financial value.

2.1 Ghar Parau Foundation – Cavelink underground set

As the depth of the cave being explored and the distance from the surface has increased, so too have the hazards. Cavers camp in the cave to make exploration practical, but this means being cut off from weather reports for several days. The entrance descends through 550m of vertical sections called 'pitches', and in rain these can turn into dangerous waterfalls. The 2017 exploration also discovered a deep section of passage that sumped as snow on the surface melted. Fortunately, the explorers were not on the far side of this passage when they discovered it blocked.

To reduce these hazards, expeditions can use specialised cave radios which can send and receive messages through kilometres of rock. These can send weather forecasts down to the cave camp, which is a safe haven even in the worst weather. This can ensure that cavers do not get trapped behind sumps or caught by flooding while exiting the cave. However, the high price of cave radios meant the Dachstein expedition was not able to afford to purchase a complete set of radios.

Ghar Parau Foundation funding of £1200 allowed the Dachstein to purchase a single underground radio, which was used in conjunction with a surface set purchased by Cambridge University Caving Club (CUCC) and also part-funded by Ghar Parau. By sharing equipment between CUCC and the Dachstein expedition, both expeditions are able to make use of this important, but expensive safety equipment on their respective expeditions.

With the help of the Ghar Parau Foundation, explorers can now push these deep caves in greater safety, and we are grateful for their support. The equipment is available for use, subject to conditions, by other suitable British caving expeditions, and we invite interested expeditions to contact us and CUCC directly.

The Ghar Parau foundation, previously part of the BCRA but now an independent charity, was set up after the second British expedition to Ghar Parau cave in Iran. The cave was explored to -742m on the first expedition, with hopes that it might continue much deeper. However, on their return on a well-funded expedition the cave sumped at -751m and could not be continued. Since then, the GPF have provided grants to worthy British caving expeditions, partly funded by interest by their own funds but largely by significant annual donations from the BCA and Hidden Earth.

2.2 UKCaving – 200 m Spanset 9 mm rope



Figure 5: UKCaving rope being used to rig in Thundergasm

UKCaving, the premier web forum for caving in the UK, has always supported cavers and caving expeditions. We were lucky enough to have been awarded 200m of Spanset 9mm rope. Many of the trip reports in this report were originally posted on UKCaving. The 9mm rope provided by UKCaving was used to rig a number of the shallower caves this year. Ensuring the expedition has enough rope and equipment supplies means that equipment does not need to be rationed to the more significant projects. Such rationing naturally tends to limit the less-experienced cavers who are generally in the shallower caves, and so UKCaving's generous donation helps us provide a fairer distribution of equipment.

2.3 Fischer – 300 expansion anchors

You can't get very far in a vertical system without some anchors to hang rope on, and so we are very grateful to Fischer, the well-known German manufacturer of high-quality anchors and fixings, who have supplied us free of charge with 200 zinc-plated and 100 stainless 8mm through-bolt anchors.



Figure 6: Bolts provided by Fischer (A Hack)

These anchors have been used in both WUG Pot and other expedition caves. Zinc-plated bolts are suitable for exploratory use, but have a limited lifespan in a wet cave. For longer-term use, stainless bolts are the only answer but are considerably more expensive. As much of WUG Pot is now a trade route that has been in use for over a decade, stainless bolts significantly increase the longevity and thus safety of anchors.

2.4 Speleoconcepts – 150 significantly discounted hanger plates

We were able to purchase 150 stainless hanger plates at significantly discounted rates as a sponsorship arrangement from Speleoconcepts, a new German web shop selling caving, canyoning, climbing and other vertical gear. We are happy to recommend Speleoconcepts to cavers across Europe as a value-for-money source of gear and equipment.



Figure 7: Hanger plates provided at discounted rate by Speleoconcepts (A Hack)

Stainless bolts need to be used in conjunction with stainless hangers for maximum corrosion protection, otherwise galvanic corrosion can occur and at a minimum the hanger plate can corrode. Lightweight aluminium hanger plates are great for deep exploration, but they are weaker than stainless plates and aluminium corrosion is both less visible than rust and more likely to result in failure.

3 Expedition Training Weekend

The Dachstein expedition has for many years ran an expedition training weekend, and 2019 was no exception. As usual, the expedition training is open to all cavers including those not planning on attending the expedition, although it is naturally focussed on the skills needed for deep, cold Alpine caves such as those in the Dachstein.

The format of our training weekend has varied over the years. In 2017 the first day of the weekend was spent in a rope access centre training for French-style counterbalance pitch hauling, with the second day spent in Pwll Dwnn putting these skills into practice. The 2018 event was more similar to this year's weekend, although it had a longer rescue practice.



Figure 8: Expedition training weekend venue (A McLeod)

This year there were 33 paying attendees, with 8 people staying for one day only and the rest staying for the whole weekend. There were also 8 trainers who attended during the weekend, all of whom attended voluntarily and without claiming expenses – for which the expedition is very grateful. As in 2018, the weekend was held at the Gloucester Cave Rescue Group headquarters which features a large meeting room, a small kitchen, camping and parking space and a large barn with various platforms suitable for SRT training. We are grateful to the GCRG for use of their venue for a second year, and were happy to make a donation to the team. The expedition provided breakfast and lunch for the two days out of the fee of £20, and a large takeaway curry order was organized on the Saturday night.



Figure 9: Expedition training: surveying in Bixhead Stone Mine (A McLeod)

3.1 Day 1 – SRT and Survey Training

The trainees were split into four groups. Two of these groups headed off in the morning to Bixhead stone mine, an underground sandstone quarry, for survey training led by Tom Foord and Rich Smith and underground survival training led by Ian Holmes and Sam Lee, with the two groups taking turns.

The survey group learned to use DistoXs and SexyTopo to survey the stone mine. Meanwhile, the underground survival group set up camp in a corner of the mine. The demonstration showed the use of various important tools, including group shelters, the ‘gimp mac’ (a waterproof jacket), the MTDE poncho (which can be combined with another poncho to share body heat with a friend), blizzard blankets and small gas stoves. Alpine caves are cold, and in the event of flooding it is critical that cavers have the right equipment to stay dry and warm.



Figure 10: Expedition training: cave survival skills (A McLeod)

The other group groups stayed at the GCRG base to practice SRT techniques and basic hauling. SRT practice ranged from the basic to the advanced. Topics covered included SRT kit setup for use in tight caves, rebelay and deviations, rope protectors, additional braking for descending on 'fast' ropes – including an 8mm rope covered in washing up liquid – and finally to rebelay with pendulums and horizontal and sloping tyrolean traverses.

The groups then swapped, following lunch, with the underground groups now staying at the GCRG base for SRT and hauling practice and the surface group heading to the stone mine for surveying and underground survival.

The final portion of the day was lecture format, with the expedition leader Joel giving an overview of the expedition and Alpine expedition caving generally. The use of survival equipment was again demonstrated and discussed, together with general information about the expedition such as where the expedition takes place, what sort of caving people should expect, what other activities are available and what people will need to bring or organize.

A brief overview was also given of French-style counterbalance pitch hauling techniques in preparation for the rescue practice the following day, including the use of plywood boards with anchors mounted on for showing rigging techniques.



Figure 11: Expedition training: advanced SRT techniques (A McLeod)

3.2 Day 2 – Rescue Practice

Following 2018's successful but lengthy rescue practice at Miss Grace's Lane, this year's rescue practice was held at the Wet Sink entrance to Slaughter Stream Cave. The cave had been pre-rigged with tri-hang anchors for the counterbalance rescues, and the trainees were split into two groups. One group went deeper into the entrance series to practice hauling a casualty up several pitches, while the other group practised on the first few pitches of the entrance series, ending with bringing the casualty out of the entrance.



*Figure 12: Expedition training: using stretchers
Wet Sink, Slaughter Stream Cave, Forest of Dean (J White)*

The surface group were first shown the use of the expedition's Ferno split basket stretcher, which was purchased last year. This stretcher is ideal for relatively large but deep caves, such as WUG Pot, and can be broken in half for carrying. The casualty was then taken down the fixed ladders to the bottom of the first pitch series, strapped into the stretcher (in a vertical position due to lack of space) and then hauled up the series of pitches.



*Figure 13: Expedition training: stretcher attachment systems
Wet Sink, Slaughter Stream Cave, Forest of Dean (J White)*

Counterbalance systems were used for the majority of the pitches, but a simple Z-rig system was used to haul out of the entrance gate and onto the surface. Both the surface and deeper group's rescue practice were successful. This rescue practice was shorter than some in previous years, enabling people to get home somewhat earlier although possibly not drilling home the important message of any Dachstein rescue practice – getting rescued will be thoroughly unpleasant, so don't hurt yourself in the first place!

4 Pre-Expedition preparation

Prior to the expedition gear, food and other equipment was purchased as normal. We were lucky to receive some sponsorship from various suppliers and retailers. Fischer supplied 300 bolts (100 stainless and 200 zinc-plated) free of charge. UK Caving supplied 200m of Spanset rope, and Speleoconcepts provided a substantial discount on the purchase of 150 stainless hangers.



Figure 14: Donated/discounted equipment (clockwise): through-bolts from Fischer, hangers from SpeleoConcepts, rope from UKCaving (A Hack)

Other equipment and food was purchased at normal prices. In 2018, we made relatively few purchases of equipment leading to the stores being relatively depleted of most equipment. Following the 2018 expedition, a full inventory was made of all food and equipment remaining in Camelot, and more equipment was purchased in 2019. As slightly less equipment was used in 2019 than expected, the expedition stores are now in a good position for future expeditions.

In the next sections, we briefly review the expedition's purchases of caving equipment, food supplies, and other equipment (such as that used to improve Camelot).

4.1 Caving Equipment

We received some equipment for caving exploration from our sponsors, as detailed in section 2. In addition, we purchased 222 Petzl aluminium 8 mm hanger plates (mostly Vrillee twist hangers but with a few Coudee bent hangers), 400 m of Beal Spelenium Gold 9.5 mm rope, 200 m of Beal Spelenium 10 mm rope and 200 Maillon Rapide 7 mm GO maillons.

For setting up a new camp in the future, we purchased twelve camping mats, three tents, two gas stoves and pans. We also purchased six gas cylinders for use during this expedition.

We also purchased a new Makita drill to match our existing drill and batteries, along with three new Hilti drill bits.

4.2 Food supplies

Food was purchased primarily in Germany by Axel Hack and in the UK by Andrew McLeod, with other purchases made by expedition participants immediately before or during the expedition. An attempt was made this year to purchase more food prior to the expedition to reduce the need for participants to bring in additional non-perishable food during the expedition, which appeared to be mostly successful. Food is divided into above-ground food, which is stored in Camelot, and underground food, which is divided between Camelot and the underground camp.

4.3 Other equipment

We purchased a new large gas burner to match our existing large burner in Camelot, which makes cooking much easier as both the rice/pasta etc. and the sauce can be cooked in large pots on large burners, rather than having to be split across several pans on much slower burners. We purchased a 24 litre pot and four 50 cm wooden spoons to match. Various other sundries were purchased, including two 2 litre measuring jugs, long lighters and refills, a set of digital scales, four plastic bowls, and washing up kit and liquid.

Thanks to continuing work by Axel Hack, the covered area at the rear of Camelot has been improved again this year, and with the purchase of a set of taps and tubing our water supply is now easier to operate as both tanks are linked. It is no longer necessary to divert the guttering from one tank to another as they fill and empty.

We also purchased one large and two smaller whiteboards to aid planning in the hut, together with a set of whiteboard pens.

5 Expedition Members

The Dachstein 2019 expedition was attended by the following Expedition members:

Table 1: 2019 Expedition members

Joel Corrigan (Dachstein Expedition Society expedition leader)

Andrew McLeod (Dachstein Expedition Society treasurer)

Jo White (Dachstein Expedition Society secretary)

Axel Hack (Expedition surveyor)

Tom Foord (Expedition surveyor)

Adam Prior

Manfred Wuits

Alex Noot

Martin Sieberer

Andreas Gumpenberger

Matt Palmer

Ari Cooper-Davis

Nadia Raeburn-Cherradi

Ben Auton

Oliver Ray

Camilla Casella

Oscar Doyle

Cat McKenna

Paul McCarron

Christian 'Wolfo' Vogel

Pavel Chaloupsky

Éabha Lankford

Petie Barry

Emily Mackinven

Rich Hudson

Emily Punzalan

Richard Cole

Gina Moseley

Rob Watson

Ian Holmes

Robbie Shone

J P Sounier

Sabrina Brooke

J P Wallace

Stefan Ager

Jessie Vaughan

Sylvain Furlan

Jim Leigh

Tom Chapman

Johannes Aitzetmüller

Veronika Schroeder

Krystal Thompson

Yolanda Razo

Lydia Leather

6 Expedition reports

This section contains a mixture of content, including a summary of the progress in each cave described, trip reports from those caves, and cave surveys. This information is primarily drawn from the expedition logbook, UKCaving trip reports, and the author's memory. Many thanks are given to those expedition members who have committed some part of their trip to writing and made this report possible.

6.1 Expedition diary (incomplete)

Some trips were not written up in the expedition logbook, or incompletely recorded, and thus are not recorded here.

Table 2: Expedition diary

Date	Trips
18 th August	WUG Pot: Tom Chapman, Emily Mackinven and others (entrance snow dig)
19 th August	WUG Pot: Paul McCarron, Emily Punzalan, Adam Prior, JP Wallace, (later) Axel Hack (entrance snow dig) see trip report 6.3.1
20 th August	Thundergasm: Andrew McLeod, Wolfo Vogel (capping), Jo White, Jessie Vaughan, Krystal Thompson WUG Pot: Sabrina Brooke, Oliver Ray, JP Wallace, Tom Chapman, Emily Mackinven (240m rope check), Adam Prior, Richard Cole, Éabha Lankford, Emily Punzalan (100m photos) Blood Moon: Axel Hack, Oscar Doyle, Paul McCarron (survey) see trip report 6.4.1
21 st August	Prospecting: Adam Prior, Emily Punzalan, J P Wallace, Paul McCarron see trip report 6.2.1 Tiergartenloch: Sabrina Brooke and Krystal Thompson Thundergasm: Wolfo Vogel, Oscar Doyle (capping), Jim Leigh, Tom Chapman (rigging check), Andrew McLeod, Jo White, Ari Cooper-Davis, Alex Noot (surface work) see trip report 6.6.1
22 nd August	Prospecting: Jim Leigh, Joel Corrigan, Krystal Thompson, Sabrina Brooke Tiergartenloch: Jessie Vaughan, Oliver Ray Thundergasm: Oscar Doyle, Wolfo Vogel (capping), Andrew McLeod, Jo White (re-rigging), Ari Cooper-Davis, Alex Noot, JP Wallace (deeper re-rigging and push) Blood Moon: Lydia Leather, Rob Watson, Adam Prior (survey lead), Nadia Raeburn-Cherradi, Paul McCarron (survey connection to Burnies) see trip report 6.4.2

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Date	Trips
23 rd August	Prospecting: Andrew McLeod, Jo White Thundergasm: Oscar Doyle, Wolfo Vogel (capping), Tom Chapman (entrance push), Ari Cooper-Davis, Alex Noot (push) Tiergartenloch: Richard Cole, Éabha Lankford, Emily Punzalan, Adam Prior, Paul McCarron
24 th August	WUG Pot: Emily Punzalan, JP Wallace, Adam Prior (camp bounce trip) Thundergasm: Andrew McLeod, Jo White (re-rigging)
25 th August	Blood Moon: Axel Hack, Tom Foord, Paul McCarron (survey) see trip report 6.4.3 Prospecting: Oscar Doyle, Petie Barry
26 th August	Prospecting: Jo White, unknown Thundergasm: Andrew McLeod, Jessie Vaughan (survey), Oliver Ray, Krystal Thompson
27 th August	Blood Moon: Adam Prior, Emily Punzalan, Petie Barry, JP Wallace, Sabrina Brooke (survey) Thundergasm: Ari Cooper-Davis, Alex Noot (push) WUG Pot 2-day camp: Emily Mackinven, Tom Foord, Andrew McLeod (survey), Paul McCarron, Alex Hack (push and survey) see trip report 6.3.2
28 th August	Tiger Trap: Adam Prior, JP Wallace, Emily Punzalan, Petie Barry (push and survey) see trip report 6.5
29 th August	Tiger Trap: Adam Prior, JP Wallace, Emily Punzalan, Petie Barry (push) see trip report 6.5
30 th August	Tiger Trap: Adam Prior, JP Wallace, Emily Punzalan, Petie Barry (push) see trip report 6.5
31 st August	Prospecting: Axel Hack, Paul McCarron (Einhöhle survey, PL2 to WUG Pot surface survey) Thundergasm: Andrew McLeod, Ben Auton (survey)
3 rd September	Thundergasm: Veronika Schroeder, Pavel Chaloupsky, Camilla Casella, Ben Auton, Matt Palmer (de-rig entrance and surface) WUG Pot: Joel Corrigan, Wolfo Vogel, Tom Foord, Petie Barry (push) see trip report 6.3.3 , Andrew McLeod, Axel Hack (push) see trip report 6.3.4

6.2 Prospecting trips

Prospecting is an important part of the Dachstein expedition. Each year, new caves are discovered and old ones re-checked as snow and ice retreats.



Figure 15: Einhöhle entrance (P McCarron)

6.2.1 Prospecting Trip 21/5/2019

Adam Prior, Emily Punzalan, J P Wallace, Paul McCarron. Trip report by Paul McCarron.

I spent the day prospecting the area above WUG, this was to mainly check a number of possible leads which haven't been pushed and also to see if we could spot any other caves in the process. The views around this region are stunning, however the weather was not on our side, with dense mist and rain constantly moving in. There were a couple of interesting leads that we found during this and we hope to head back soon in the coming days.

Dachstein 2019 has been my first expedition and so far I've really enjoyed it. I look forward to remaining week and a half I still have out here!

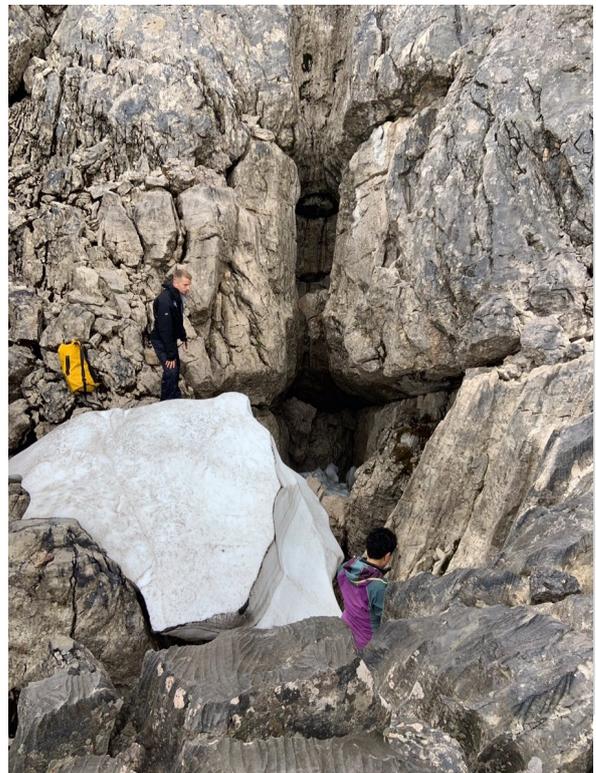


Figure 16: Prospecting lead (P McCarron)

6.2.2 Prospecting Trip 25/8/2019

Petie Barry and Oscar Doyle. Trip report from Petie Barry.

A trip to check out some small caves close to the Wiesberghaus, aiming to find a cave that might lead towards Uphill Gardeners in WUG Pot.

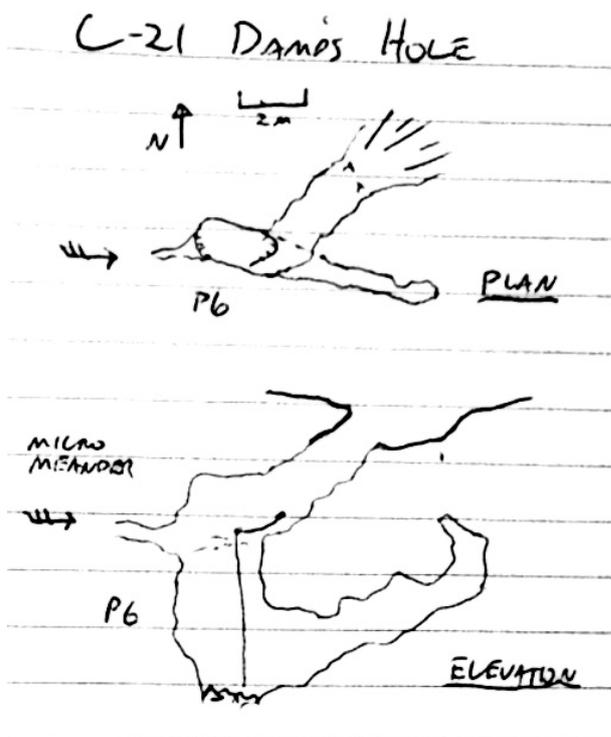


Figure 17: C-21 Damp's Hole survey (P Barry)

down to the bottom having added a deviation near the entrance. At the bottom of the pitches was a **very** awkward descending rift to reach a constriction. Beyond, there was an about 6m pitch and thrown rocks fell a fair bit further. We capped for about an hour. We did a bit of damage but it needs a solid session. It's promising! We left it rigged.

C-21 (Damp's Hole): Put in a rope to drop the 6m pitch. There are 2 spits here for rigging. At the bottom there was nothing. Just below the pitch head there was a micro-meander with a good draught, but not worth capping.

E04-18: A small entrance about 5/6 m from the Simony hut path. A short crawl leads to a 3m free-climb to a small chamber. Another 3m climb leads to a dead end in a small chamber. Back in the first small chamber there was a choked draughting crawl which we dug for 15m. Draughting but too much capping required.

E18-HKS1 (Spezielleshöhle): An about 25m deep cave found in 2018 by Axel and Julia. Rigged

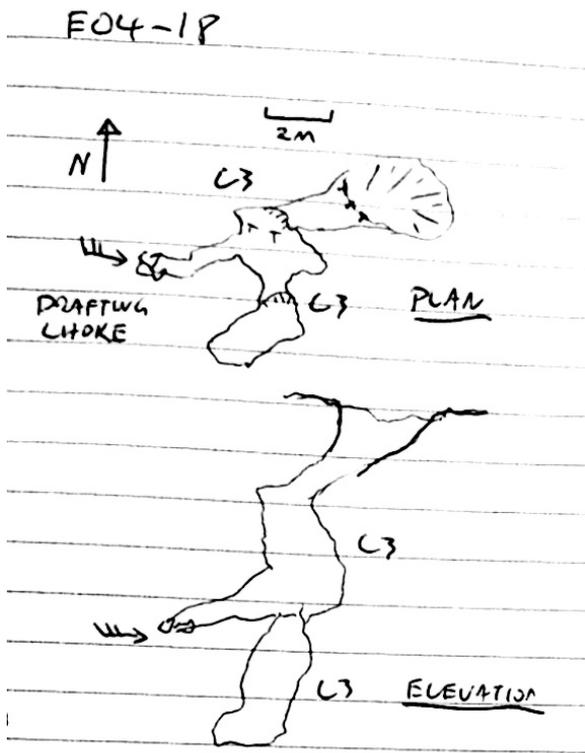


Figure 18: E04-18 survey (P Barry)

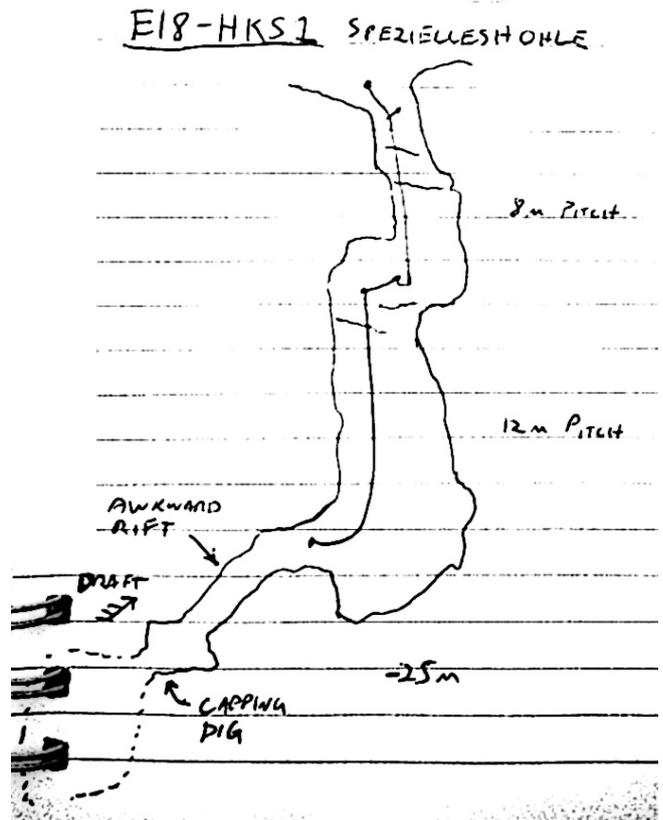


Figure 19: E18-HKS1 survey (P Barry)

6.3 WUG Pot

WUG Pot is the main expedition cave, and has been explored for over a decade. In 2017 it was finally connected to the Hirlathöhle, adding a new depth of over 1500 metres to the Hirlatz's over 100 km of length. After the vertical pitch series of over 500 m depth, the cave changes character to the massive phreatic tubes seen elsewhere in the Hirlatz, complete with a thick sticky mud.

A camp was established some years ago in one of these large passages, and after several years of digging at this camp (the Chutney Mines) a breakthrough was made to significant further passage, which led (after year of further exploration) to Austrian Airspace, originally reached by diving from the furthest reaches of the Western Hirlatz.

WUG Pot has now been almost entirely surveyed, although many leads still remain. Surveys showed a possible connection between PL2 (another cave) and the PL2 inlet in WUG which had been neglected previously. There were also possible bolt-climbing leads at the end of Uphill Gardeners (near the base of the pitches) and PL2 Inlet. The connection with the Hirlatz needs further exploration to find a dry link to the Hirlatz, but trips here are long and arduous.

Due to large amounts of snowfall over the winter, the entrance was still buried under several metres of snow at the start of the expedition. Two days of digging was required before the cave could be entered, and the first section of the cave was very drippy from meltwater.

The WUG Pot survey is available in Appendix A.



Figure 20: Clearing snow from the WUG Pot entrance (P McCarron)

6.3.1 Entrance snow clearance 19/8/2019

Adam Prior, Axel Hack, Emily Punzalan, J P Wallace, Oscar Doyle, Christian 'Wolfo' Vogel. Trip report from Paul McCarron.

The push to clear the entrance into WUG continued for second day with a small team of six working tirelessly for hours to clear the entrance which was composed of mostly the Irish Crew (Adam Prior, Emily Punzalan, JP Wallace and myself) along with Wolfo and Oscar Doyle.

Eventually after around 3 hours or so, Axel turned up after to have a gander at how we were getting along and of course offers to lend a hand, after which he breaks through into the entrance after the first hit! He just wanted to steal our glory!

We spent a bit more time tidying up and marking caution tape around the entrance to secure the snow a bit more. All in all a great effort from all involved. The evening then consisted of a lovely walk back to Camelot in the rain.



Figure 21: WUG Pot entrance after digging (P McCarron)

6.3.2 Survey Trip 27/8/2019 – 28/8/2019

Tom Foord, Axel Hack, Emily MacKinven, Paul McCarron, Andrew McLeod. Trip reports from Andrew McLeod and Paul McCarron.

Trip report by Andrew McLeod:

Got back yesterday from a camping trip down WUG yesterday; still knackered...

We left on Tuesday morning at around 11am after a brief Cavelink related delay, heading up the hill and down the pitches towards camp. Due to the snow above the entrance, the entrance pitches (including the Tyrolean traverse a few pitches down) were exciting drippy and the Gimp Mac (an old/cheap waterproof, Dachstein patent pending) were essential for avoiding freezing in the cold snowmelt water...

After the entrance pitches, the drappiness went away and it was back to the usual fairly dry descent. After a few more pitches we went down the 70 (70m of pitches) and then the 110 (80m of pitches as the current rope avoids the bottom). This is followed by a few more pitch series, the Meander (a traverse at different levels across the top of the meander), various awkward pitches and final the final pitch series until the base of the pitches is reached.

The cave then changes character completely. Instead of vertical shafts and vadose canyons, you immediately walk into giant fossil phreatic tubes with mud and rubble floors. A short pleasant walk reaches the top of Deep Sludge, a ramp with a vertical height loss of around 120m. Some of the ramp is on rubble, but most is on a horrifically sticky mud which liberally coats itself onto your gear and makes your boots weigh twice as much as usual.

Eventually the camp, which is actually very pleasantly positioned in the large tube on a dry mud floor, is reached. However, there is no rest for the wicked, and after dumping camping gear we headed on to help resurvey some nearby parts of the cave.

The onward route is via the Chutney Mine, a small dug crawl where the roof of the main passage drops. This leads into the large Chutney Chambers. A small awkward muddy slot - It's Not Ideal - near one wall leads to a small pitch down to continuing passage. This was the breakthrough in 2016 to the rest of the cave.

Our destination was the Glory Holes, a small very muddy dead-end passage, and another unnamed passage. After surveying, we headed back to camp for well-deserved food and sleep.

Meanwhile the other camping trip pushed a new tight lead at the head of Deep Sludge.

The next day we got up, ate breakfast, packed up the camp and headed off to the Left Fork, a passage off from the base of the pitches. One team set off to take photos of the passage, while we headed down into the Left Fork Basement, a small passage entered in the floor of the Left Fork passage. Unlike the mostly large tunnels of the Hirlatzhöhle, this was a much more British sized passage that wouldn't seem out of place in OFD.

We surveyed 195m of passage which varied from tight boulder entrance to reasonable walking passage to rifted canyon to flat out crawl where the ceiling drops and finally ending in a chamber with a run-in boulder choke, probably from the Left Fork above.

After heading back to the base of the pitches, we began our ascent out. The ropes in the lower parts of WUG are liberally coated in mud, so your ascenders jam and don't bite on the rope. The pitches are also more difficult in the lowest 150m, with several awkward pitch heads and the meander which makes taking a big camping bag difficult. Finally after reaching the base of the 110 we still have most of the distance left but most of the difficulty is gone. A few hundred metres of prussiking later I finally escaped the muddy grasp of the Hirlatz, emerging shortly after midnight to clear starry skies.

Sadly my gear did not escape the muddy grasp of the Hirlatz and is still mostly brown...



Figure 22: First team preparing to descend WUG Pot (P McCarron)

Trip report by Paul McCarron:

The highlight of my Dachstein trip.

After an agreement between all parties involved we made the decision to push this trip back to Tuesday 27th August. There were two teams. One team, comprised of Emily MacKinven, Tom Foord and Andrew McLeod, would be completing a number of

surveying and pushing tasks beyond camp. The other team, comprised of Axel Hack and myself, would be pushing the number of leads surrounding the Deep Sludge area of WUG. On the following day, Emily would switch groups and join ours for some photography. The other duty for Axel and myself would be to test functionality on all of the Cave Links in the cave, especially the unit at camp.

Team one entered at 11am, followed by Axel and myself around 12am. It took us around 4 hours to descend all 590m of pitches, arriving at the bottom of the pitches at around 4pm.

Once down, we walked toward Deep Sludge, removing all unnecessary equipment so that it wouldn't get clogged in mud. We headed for the initial upper lead and, with the trusty crowbar and hammer in hand, we made steadfast work in removing the boulder blocking the way, squeezing into what we had initially thought would be a large open and spacious chamber with possible lengthy leads. Unfortunately, we had our hopes far too high and the new passage ended just after 20 metres in a mud sump. We quickly surveyed the area nicknaming it Peanuts (a bit like when you pay someone peanuts or give me a peanut chocolate bar). So with that disappointment, we quickly surveyed the passage to scrub the thoughts from our minds before heading down to the lower passage.

Axel had been also going on about this lead, but I couldn't quite put it together why he had been calling it "The Exhaler." For a solid few hours prior I thought he had been calling it "The Excalibur" but shortly after arriving I quickly realised why it was called such. Looking down on the pitch-head seen a tight constricted climb down through a meander. There was not much room and it was heavily drafting. Axel got me to sort out the drill and pass it down with associated hardware such that he could rig a pitch to investigate what was below the constricted entrance and what a tight entrance it was. On the way back up Axel managed to get stuck in a position where he found it difficult to move either of his jammers up to maintain progression, as he had very little body movement available.

While this had been happening, I had been sitting for about 90 minutes at the top of this pitch getting cold despite wearing four layers. So after Axel had tired himself out and got through the constriction, it was decided to get the hell out and head down to camp. But unknown to Axel at the time, the cave had stolen his watch – forever giving this pitch the name of "Time Bandit."

Camp in WUG is quite nice – the only depressing thing is the pitch series you have to go through to get water, but apart from that it's quite a cosy stay. Chef Axel decided to make us some dinner after sorting through the carbide mess to pull out the sleeping bags and other camping equipment. On his menu was delicious cous-cous with a side of spicy sauce and mud, some cup-a-soups for refreshment, followed by a desert of Tesco value chicken flavoured noodles with a sprinkling of mud for seasoning. Quite delicious if I might say so. Following the fulfilment of this meal the five happy cavers decided to drift off to sleep and have some cosy dreams about the journey into WUG.

The rude awakening by the party was complemented by Axel preparing coffee for us; however, word had spread the night before that porridge is my speciality so it was my turn to impress the guests. For breakfast, a delicious serving of honey flavoured Ready Brek was served with a hearty side of raisins. The meal was delicately served with some additional mud for seasoning from the previous night's washing up (yes, the washing up in WUG is completed with mud!) – yummy.



Figure 23: Hot drink left at WUG Pot (P McCarron)

Camp was swiftly packed up after the morning faff was completed and team two, now of three, headed out towards Deep Sludge to take pictures on the way down PL2 passage. Switching between Emily and myself as models for Axel's shots we slowly made our way through the passage until we got to a fantastic waterfall area. This was exactly when the flash bulbs stopped working! Bummer. Pissed off and disheartened from ever undertaking cave photography again, we all decided to walk towards the unclimbed aven in PL2 passage to see if there was any possible bolting methods that we could take. It was also here that we stumbled across the perfect place for a second camp – except that there was no running source of water that wasn't at least 20minutes walk away. This marked the end of our exploration, and we made our way back to the bottom of the pitches and sorted out some equipment before brewing a quick pot of coffee to share between us.

The prussik back out was quite uneventful. The biggest thing to note was how awkward the first initial 150meters of pitches were simply due to how much mud was on the ropes which caused all of the jammers to constantly jam up! A complete nuisance but manageable. For some reason my tired brain decided to make me pop my Gimp-Mac on at the bottom of the 110 pitch, which meant for 300meters I was overly warm, simply because I thought at any moment I would become overly wet. This didn't happen until the tyrolean, about 50m from the entrance. Silly me. The total 'out' time for myself was just under seven hours, although I don't actually have an accurate time as I forgot to check my watch before heading up, but I know I was out at around 1am, so around 36+ hours within that cave.

Joel had left some hot drinks in a flask at the exit which Axel had poured for me as he heard me exit. A quick change out of the mud-fest clothes allowed me to sit in the dark watching the stars as we waited for the others to exit, who were only 30minutes behind.

All-in-all a fantastic trip, and I look forward to doing similar on my next return trip to the region.

6.3.3 PL2 Connection Attempt 3/9/2019

Joel Corrigan, Tom Foord, Christian Vogel, Petie Barry. Trip report by Petie Barry.

Since last years connection between WUG Pot and the Hirlatz the combined depth of the Hirlatzhöhle system is 1560m, making it tied at ninth deepest cave in the world with the Sistema Huautla. Also last year, a connection was made between the nearby caves of Burnies and Blood Moon. These two latter caves sit at a higher altitude than WUG, with the entrance of Burnies sitting about 58m higher than WUG. Less than 60m separate WUG and Blood Moon, with several leads heading from Blood Moon toward WUG.

Higher still is the cave of PL2. This is a classic Dachstein cave - cold, drafty, narrow, hard, and generally unpleasant. Originally pushed in the late 80s by a Polish expedition, the cave ended in a 100m free-hang into the largest chamber in the Dachstein, lying only a short distance away from WUG. A large branch passage exists from WUG heading towards PL2, and re-surveying last year positioned the end of this passage at 40m below and 20m away from the end of PL2, with a high-level continuation visible from the foot of an aven.

The connection with PL2 would add some 78m to the depth of the Hirlatz, positioning it as the world's sixth deepest and Europe's second deepest cave system. Pushing PL2 Passage from WUG was then one of the main focus's of this expedition.

Mid-way through the expedition a team of Jean-Paul Sounier and Sylvain Furlan pushed this passage. Aid-climbing up the aven for 8m, they climbed an ascending canyon reaching a large chamber some 40m long by 15m wide. At the very end the draft emerged from the foot of a boulder run-in, with no way on apparent. A few days later Tom Foord, Tom Chapman and Nadia Raeburn-Cherradi went and surveyed this extension, and in conjunction with a surface survey between the WUG and PL2

entrances, this indicated that the two caves were separated by as little as 10m. They looked at the choke and Tom F had been able to poke his head in enough to see black spaces just above the underside of the choke. Without tools they hadn't been able to do any proper digging, but it was felt that the choke might be a short one, and with a bit of luck it might be possible to collapse the boulders and climb upwards into the PL2 chamber.

So, on Tuesday morning Joel Corrigan, Tom Foord, Christan Vogel (Wolfo) and I set off on a camping trip with the hope of connecting WUG and PL2. Laden with gear, including a huge 1.2m long crowbar we made sluggish progress down to the bottom of the ropes at -580m. Ditching our camping gear, we made off into the huge horizontal tunnels that make up the majority of WUG. After a half-hour tramp up and down over boulders we reached the turn-off for PL2 passage. This passage was originally pushed by Joel Corrigan and company some 8/9 years ago, and started off as a series of short upward rope pitches separated by sections of muddy horizontal passage. The third of these climbs is particularly awkward, being a dismal trudge up a mud ramp while struggling to move jammers on the greasy rope. Lord only knows how Joel climbed this originally. At the top is a squeezey boulder choke, which finally pops up into another big horizontal borehole. Unusually for WUG this passage is filled with old muddy flowstone, with some big pillars and stals visible. Some of the old calcite is disintegrating into fine calcite needles, which sit in the mud and make it remarkably clumpy, wellies can swell to three times their size within a few steps.

Up Jean-Paul and Sylvain's ropes we went, skinny 8m bootlace rope, exactly what you want when you are completely caked in mud. We reached the chamber after some 10-11 hours of hard caving. While Joel and Tom set up a stove to make a hot meal Wolfo and I started prodding the choke. The first few boulders were easy to drop out of the roof, enough to reveal that the black spaces were just more voids in boulders. The boulders seemed to continue up, tightly packed for several metres. After 5 minutes it was apparent that we weren't breaking through, but since we'd come all this way we continued on making increasingly futile progress for some 45 minutes. Caked in mud and frozen by the powerful draft, we gave up.

Joel and Tom had enough energy to climb a nearby mud slope and drop a tight pitch at the far side. This dropped into a small chamber going nowhere. Other drafts were followed into chokes in the floor, but there was nothing happening. We started the grim plod back down the passage. At around six in the morning we arrived at camp, then began the chores. Gathering water from camp was a particularly unwelcome task, involving hauling water drums up a series of awkward climbs and pitches from the foot of a drippy waterfall. Finally at 10 in the morning, as Europe set about it's day, we went to bed with over 18 hours of caving behind us.

Waking at 4pm, we spent the day sorting gear and closing up camp for another year. The WUG camp is a fairly pleasant space to while away the day, once you're dry and active it's fairly warm. Also, a bit of music makes it a much more homely space. At midnight, we set off for the surface, collecting various bits of kit along the way, arriving on the surface to morning sunshine.

Sadly, WUG remains at the same depth it did at the start of the exped. We'll continue to push both Blood Moon, Burnies and PL2 in search of a connection to a higher cave. Who knows, perhaps pushing from above in PL2 will reveal something not obvious from below in WUG...

6.3.4 Uphill Gardeners pushing trip 3/9/2019

Axel Hack, Andrew McLeod. Trip report by Andrew McLeod.

We are coming towards the end of the expedition now. The entrances pitches of Thundergasm and Blood Moon have been derigged, and the last camping trip down WUG should be coming out early in the morning.

I am still recovering from my final trip down WUG. This was a bounce trip with Axel to push a lead in Uphill Gardeners, a rising inlet passage that leads from the base of the main pitches. After a relatively faff-free morning we set off at 8:30am and were underground by 11am. Three hours saw us at the base of the pitches, and another hour saw us at the current lead.

As Uphill Gardeners is directly off the base of the pitches it is not well-positioned for a camping trip since this would involve the extra trips to and from camp, hence our bounce plan. Uphill Gardeners is walking passage (with many small bouldery climbs) which slowly heads up towards the surface. Unlike most WUG passage there are actual formations - stalagmites, flowstone and other calcite formations, suggesting this passage is very old. We hope it will pop out somewhere on the surface in the vicinity of the bar!

Previous progress was halted at a chamber where the walking passage ended but there was a possible continuation at a higher level. Below this entrance is a mud slope, ending in a flowstone overhang. Consequently Axel bolted a lengthy traverse around the top rim of the chamber. The mud was a real problem; the hardest part of the climb, according to Axel, was getting feet in and out of the muddy etriers.

The Fischer through bolts we were using held steady even in surprisingly poor rock. This was good as the rock quality was very variable!

After about 4 hours, Axel had reached the upper continuation - which went! Unfortunately we didn't have time to do any proper survey, and therefore restricted ourselves to the first 100m of passage but what we saw was one of the nicest passages in WUG. It has a dry mud floor, easy walking, a good draught and formations as well.

We then cooked a freeze-dried meal each and started to head out. We were at the base of the pitches at around 10am and took a respectable 6 hours to prussik out, meaning we got out the cave around 4am and we're back in the hut and ready for bed around 4am.

I am still recovering, but doing my first bounce was good fun if incredibly tiring! :)

6.4 Blood Moon



Figure 24: View from Blood Moon entrance (under snow plug) (P McCarron)

Blood Moon is a cave discovered in 2018, which was subsequently connected to the deep cave Burnies' Pot adding to its depth. The aim was to connect this cave to WUG Pot, which would add significant depth to WUG Pot and therefore the Hirlatz as Blood Moon is a higher entrance.

6.4.1 Survey trip 20/8/2019

Axel Hack, Oscar Doyle, Paul McCarron. Trip report by Paul McCarron.

Axel, Oscar and myself decided to head to Blood Moon, a particularly interesting cave and one of Axel's objectives for the expedition due to its location and possible linkage to another cave nearby: Burnies' Pot. However, Blood Moon required surveying the second half of the cave to prove the linkage to Burnies' Pot.

So we went about completing this task, surveying as we went along until we descended down the final 30m pitch of Blood Moon. Axel keenly spotted the pitch entrance for Burnies', rigging it halfway down this initial pitch. The survey was thus completed, linking the two caves together.



Figure 25: Blood Moon entrance (P McCarron)

This is an interesting project as there are many leads still to push in these caves which could end with the possibility of a linkage to other systems.

6.4.2 Pushing trip 22/8/2019

Adam Prior, Lydia Leather, Nadia Raeburn-Cherradi, Paul McCarron, Rob Watson. Trip report by Paul McCarron.

The objective for this trip surrounding a possible connection between Burnies' and WUG as the comparison between the two surveys noted an unsurveyed passage which could have had the possible connection to WUG (it sort of headed in the right direction) we also had to re-survey the connection to Burnies' after an issue with Qave resulted in the last 3 stations being lost.

Unfortunately, this was also the trip I found out I still had a peanut allergy after eating an unmarked cereal bar, so with storm shelter up, candles out to keep warm and a heart-rate of 5000 I attempted to keep calm whilst the allergy passed – obviously hoping that I wouldn't be killed in a cave from what I ate! This was quite amusing though, as Lydia made sure for the remainder of the trip I did not forget about this! (N.B still need to go for that allergy test). So Adam, Nadia and myself left Lydia and Rob to push the possible lead, which was through a tight rifted meander. On the way out however we spotted lights and a much easier method of rigging.

6.4.3 Pushing trip 25/8/2019

Axel Hack, Paul McCarron, Tom Foord. Trip report by Paul McCarron.

My final trip into Bloodmoon was with Axel again – he we wanted to try and push one of the possible Israeli leads found the previous year. Before we arrived at the entrance, however, we made use of our spare time to set up the tarp outside of the WUG entrance to make storing gear a bit easier in the area. Some dubious rigging was made to try and attempt to make the passage as safe – not sure much can be done with 8mm rope, significant rope rub and not enough anchors – but oh well, we made the best of a worse situation. The lead dropped into a tight rifted meander, as is common for Dachstein caves and ended in a tight squeeze – the passage could be seen to go forth, but alas was too constricted and unsuitable for capping! Tom Foord almost joined us but some almost incomprehensible reverberated dialect from myself stopped him from jumping down the sketchy rope. All in all a successful trip and the lead surveyed – now only one further lead remained which would be left for another team to explore.

Blood Moon is quite a nice cave; the worst bit about it is the horrifically steep walk up to it, made worse with a heavy backpack – think 75 degree slope! It has around 150m of pitches and takes about 3 hours round trip if you are bouncing – a must visit if popping over to Dachstein.



Figure 26: Improved WUG Pot tarp (P McCarron)

6.5 Tiger Trap

Tiger Trap was discovered in 2018, and was explored more thoroughly in 2019.

The Tiger Trap survey is available in Appendix B.

Adam Prior, Camilla Casella, Emily Punzalan, JP Wallace, Petie Barry. Trip reports by Petie Barry.

Tiger Trap was my first cave on the Dachstein Expedition. In 2018 I arrived up the mountain and my first trip beyond the Wiesberghaus was a prospecting trip in Schladmingelloch, a huge glacial corrie. One of the caves that Joel advised us to visit was the C-106 (Tiger Trap). This was a promising lead he'd looked at in 2005, and was happy to turn over to the young folk.

The entrance is a 2m square horizontal opening, dropping down onto a large snowbank that you can shuffle down into a 6m square chamber. The most obvious route out of this is a climb up and over a loose pile of scree and then down into the foot of an aven. Leading off from this is a narrow calcited rift, that ended in a minuscule squeeze. Here, Rob Moffat somehow managed to squeeze through, descending through several more squeezes to the head of a pitch he estimated at 30m deep. But no-one else was able to follow.

More interesting was the discovery of a 16m pitch off the entrance chamber, accessed via a flat-out crawl over scree. Later it transpired that the cave had been visited by a prospecting party in 2017, and they hadn't found the pitch as it was covered by the snow slope.

The interest in Tiger Trap was in its position 800m above the recent extensions at the far end of WUG. If a more direct way could be found to far end of WUG this might open up the area for further explorations. Also, given the position of Tiger Trap at the back of the Schladmingelloch corrie, with numerous large choked shafts above and beyond the cave, there was the possibility to break into a large shaft series that could descend anything up to 800m before hitting the horizontal levels.

Flash forward to 2019.

Trip 1

A group of Irish cavers had flown out a drill, bolting kit, and a capping kit with Tiger Trap planned as a key project. The group pushing the cave was Petie Barry, Adam Prior, Emily Punzalan, and John Paul Wallace. After reaching the cave we got off to a poor start with me forgetting my SRT kit, and realising that we'd left all the through-bolts at Camelot. JP heroically lent me his SRT kit and went off on a two-hour round hike to pick up the through-bolts. To pass the time until JP returned the rest of us went to cap the squeeze at the end of the main passage. After setting off two caps, Adam squeezed through and reported that the 30m pitch was actually 10m free-climb into the foot of a large aven, with a possible continuation. It took about 6 more caps before the squeeze was passable to SRT kit-clad cavers of a more average build. We called this passage

Righty Tightly. By now JP was back with a fistful of through-bolts, and a bit sunburned after two hours in the sun.

So off to the other lead, the 16m pitch. This was soon rigged and dropped. At the bottom there was another drop of 6m, and also a boulder-choked crawl under the wall of the pitch that seemed to lead into a large chamber. I kept rigging down, with the 6m pitch dropping to the head of a 3m pitch, after which a short crawl lead to a 15m pitch. By now we'd run out of rope and metalwork, so I drilled several holes in preparation of another push the following day. While I'd been drilling, Adam and Emily had dug out the boulder-choked crawl to reach the head of a booming 23m pitch. This was a very promising lead! So at the end of the day we'd turned our two leads into three, a very satisfying return. The main route ending in the 15m pitch we called the Sunburn Series, the big pitch we called Next Big Thing, expecting it to be just that, a huge never-ending lead.

Trip 2

Expecting to drop a huge number of pitches, we carted up 100m of rope and about 25 hangers and maillons. We went straight for the jugular, bolting and descending Next Big Thing. Alas, at the bottom a 6m free-climb lead to a progressively narrower rift that quickly pinched off. Leaving the other three to survey, I grabbed a 50m rope and headed back up the pitch to continue rigging the Sunburn Series. As I approached the end of the previous day's rope I suddenly heard water falling. It was as if someone had turned on a shower, it was that instant. Thunderstorms had been forecast, so this was no great surprise. We ditched the gear and high-tailed it for the entrance chamber, spending 2.5 hours sitting in a shelter listening to the thunder rolling outside and making inane chit-chat. Eventually Emily tired of the inane chit-chat and decided to make a bolt for Camelot in the rain, the rest of us followed her lead.

Trip 3

Straight down to the end of the Sunburn Series today, popped in two bolts and dropped the pitch. At the bottom, the only way on was a desperate squeeze along a rift that only Adam could manage. A little further along he found a narrow 8m pitch down a rift, which was blocked by several boulders. With a lot of capping needed to even reach the pitch, this lead was more or less dead. We went all the way back to the surface for some sunlight. Adam and JP headed back to Camelot, eager to beat the forecast rain. Emily and I were happy enough to chance pushing the Righty Tightly rift, and headed back and pushed through the previously capped squeeze. A few further squeezes down the rift we reached a tight squeezey pitch head. I popped in a bolt and abseiled down through the unpleasant drippy squeeze. At the bottom of the 8m pitch was a 5m diameter chamber with the way on a snaggy hole through boulders. I wriggled in, in full kit and gimp mac, and got properly shredded. Beyond was 6m of rift reaching another 15m aven. The way out of this was a tight rift, which reached a 6m pitch. Sadly this was too tight to get to. However, it was clearly continuing beyond, and drafting strongly. We left an 8m rope for a push the next day.

Trip 4

A solo derig with Camilla Casella for surface support / donkey work. I derigged the Sunburn Series and then went down Righty Tightly to retrieve all the gear. Overnight I'd decided I wasn't bothered capping the tight pitch head - in spite of its promise it was only 33m down and already getting fairly desperate. Capping the pitch might only suck us into an unending circle of miserable pushing drips with increasingly committing ongoing passage. Joel had warned me that Schladmingelloch caves are typically miserable and hard. While struggling to derig the tight drippy pitch and fighting my way up through the squeezes with a rope bag I felt vindicated with this decision. Perhaps next year if we've nothing else on we'll have a crack again.

Total passage surveyed was c.200m, and 57m deep at the deepest. A fun adventure while it lasted.

6.6 Thundergasm

Thundergasm is a cave that was discovered in 2017 and pushed to a depth of around 150m in 2018 and 230m in 2019. The first 100m depth is mostly vertical pitches, but after this the cave changes character to a classic Dachstein series of meandering rifts and short pitches.

The Thundergasm survey is available in Appendix C.



Figure 27: Thundergasm tarp (entrance behind photographer) (Ari Cooper-Davis)

6.6.1 Preparation and rigging trip

Ari Cooper-Davis, Alex Noot, Andrew McLeod. Trip reports by Ari Cooper-Davis and Andrew McLeod.

Trip report by Andrew McLeod:

Thundergasm is a reasonably new cave - discovered by The A-team (Alex, Alex, Andy, Angie, and Ari) in 2017. It was found when a prospecting team hunkered down in an emergency shelter to sit out a thunderstorm, and emerged to find that they were sat right next to the entrance.

This was the first year in the Dachstein for all members of The A-team, and exploring the cave has provided some fantastic learning opportunities for many of the people

involved; from placing bolts and making surveys to capping squeezes and everything in between.

Last year the surveyors left the cave at about 200m deep, with an unexplored meander twisting off into darkness at the bottom of a wide and deep aven. But this year we couldn't just jump straight back into exploring - there were other chores to do. The entrance snow slope had melted enough for the rigging to become awkward, and there were a fair few other pitches deeper in the cave that had been rigged rather precariously with limited rope and bolts in the heat of exploration excitement.

So the surviving members of the A-team and a new cohort of explorers set about bolting, rigging, and capping to make the journey to the pointy end a bit more manageable. The entrance pitches were rebolted and rerigged, the Sphincter (a tight meander at about -100m) was capped to oblivion, and a few traverse bolts were thrown in here and there to replace some of the more "creative" naturals.

They even put a tarp up to store kit by the entrance.



Figure 28: Exploration in Thundergasm (Ari Cooper-Davis)

Trip report by Ari Cooper-Davis:

And then the pushing team went in, which is where Andrew's post leaves off.

Travelling light, having already moved most of the rope down to the end, they made it down in record time. They dropped the last pitch and headed off into the unknown...

The unknown turned out to be a deep and remarkably slippery meandering rift. If you've ever been to Afton Red Rift in Devon then imagine that but on Alpine steroids. Undeterred they free climbed what they could and bolted and rigged what they couldn't. After 3 pitches, about 50m of depth and 50m of horizontal wriggling they found themselves at the top of a large and deep aven.

As the water from the rift poured down the pitch the character of the surrounding cave changed completely - rusty red crumbling rock turning dark and brutally sharp. And at the bottom of the pitch this impenetrable rock forced the water down into an even tighter, sharper, and lower meander than had carried it before.

Running out of time and with a literally uphill struggle ahead of them the pushing team put this continuation behind them and set off back for the surface. The cave is no longer the tiny entrance series that it once was, and by the time they reached the surface the sun was setting.

So the story of Thundergasm continues - the new passage needs surveying, new leads need exploring, and more fun needs to be had.



Figure 29: Tight inlets in Thundergasm (Ari Cooper-Davis)

7 Expedition finances

A summary balance sheet for the income and expenditure for the expedition are given below. The British Pound Sterling (GBP) bank account and Euro (EUR) cash account are run separately, but to allow easy comparison a combined figure has been produced at an exchange rate of £ 0.91 / € 1. One currency transfer was made, exchanging £ 90 cash for € 103.42. No GBP cash reserves are held.

7.1 Balance Sheet

Table 3: 2019 balance sheet for GBP, EUR and combined

	GBP bank account	EUR cash account	Indicative combined figures at £ 0.91 / € 1
Starting balance	£ 350.49	€ 293.50	£ 617.58
Income			
Net balance from training weekend	£ 195.24		£ 195.24
Expedition fees	£ 3,030.81	€ 90.00	£ 3,112.71
Donations/grants (excluding Cave-Link)	£ 100.00	€ 100.00	£ 191.00
Food and daily charge	£ 310.56	€ 290.00	£ 574.46
<i>Subtotal</i>	£ 3,636.61	€ 480.00	£ 4,073.42
Expenditure			
Food shopping	£ 313.49	€ 346.50	£ 628.81
Hut supplies and equipment	£ 295.99		£ 295.99
Caving equipment and supplies	£ 2,011.37		£ 2,011.37
Fuel contributions	£ 51.82		£ 51.82
Wiesberghaus expenses		€ 350.00	£ 318.50
<i>Subtotal</i>	£ 2,672.67	€ 696.50	£ 3,306.49
Currency transfer GBP to EUR	-£ 90.00	€ 103.42	£ 4.11
Net balance	£ 873.94	-€ 113.08	£ 771.04
Final balance	£ 1,224.43	€ 180.42	£ 1,388.61

7.2 Income and expenditure charts

The charts below are produced using the indicative combined GBP and EUR figures.

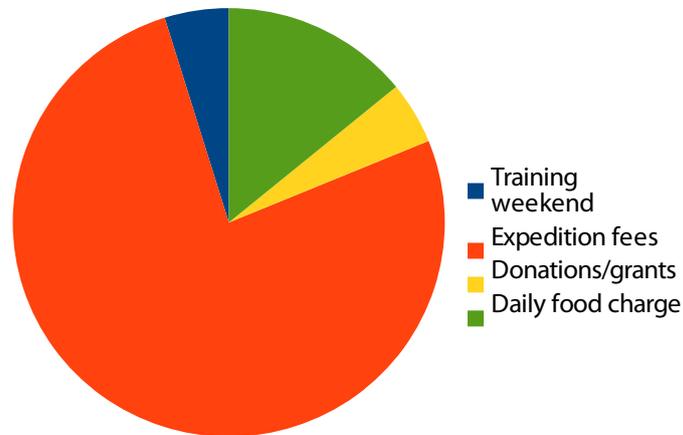


Figure 30: Income (combined GBP/EUR)

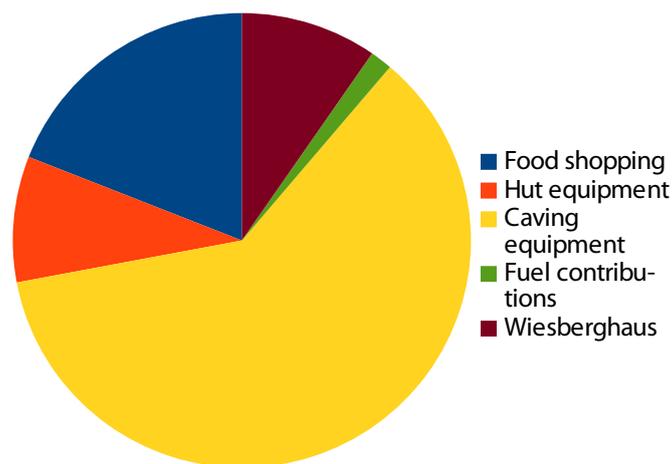


Figure 31: Expenditure (combined GBP/EUR)

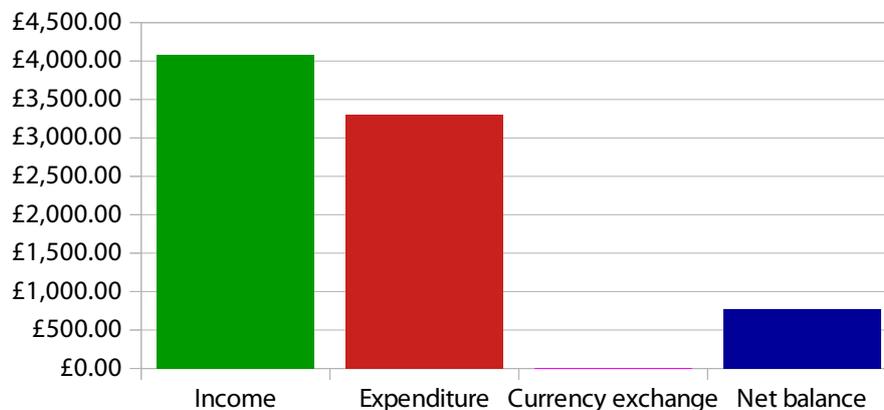


Figure 32: Income, expenditure and balance (combined GBP/EUR)

7.3 Treasurer's report

When planning for this year's expedition began, there were no accounts from the previous year to examine and it was not known how what funds were left from the previous year. After a new bank account was set up, I received the funds from last year both in another bank account and from last year's PayPal account, which were used for the initial spending of the expedition.

Last year there were difficulties during the expedition in accessing the account being used for the expedition funds, and less equipment was purchased than was used. For this reason, spending was likely higher this year (although accounts for 2018 do not exist) as we sought to restock both food and caving equipment. Since we probably used slightly less equipment than in 2018, our stocks of food and equipment are not fairly healthy (although see section 7.3.3 for future spending possibilities).

7.3.1 Income

The training weekend raised a small contribution towards the expedition but it is run primarily to provide training and advertise the Dachstein expedition, rather than as a money-making venture. We received considerable support from various bodies, as detailed in section 2, but these were primarily in-kind donations: sponsored or discounted equipment and the Cave-Link system from Ghar Parau Foundation, and therefore do not appear on this balance sheet. Nonetheless we are very grateful to our sponsors and the GPF, as their contributions significantly lowered our expenditure on caving equipment.

The only financial donations we received were the £ 100 retained deposit from the Ghar Parau grant, which we received after submitting the expedition feedback, and a donation of € 100 from visiting cavers in Austria.

The bulk of our income came from expedition fees, which were set at £ 70 if paid sufficiently in advance, rising to £ 80 if paid during or after the expedition. The majority of the expedition fees were paid in GBP either by UK or international bank transfer or via PayPal. One expedition fee was paid in euros at an approximate equivalence.

In addition to the expedition fee, we raised some funds via the daily food charge of € 1.50 per day, which is intended primarily to ensure expedition participants contribute to the cost of food they eat and to allow fresh food to be purchased during the expedition. For the latter reason, this is intended to be collected in EUR in cash, but a significant number of participants paid in GBP in arrears by bank transfer.

We did collect a small amount of GBP cash, partly from the training weekend and partly during the expedition. Part of this was used to reimburse expenses and part was changed into EUR cash at a rate of £ 0.8702 / € 1. As a matter of expedition policy, we do not store GBP cash between expeditions, but maintain the EUR cash float for use on the mountain. Some EUR cash was used to reimburse shopping trips for the expedition and other expenses.

7.3.2 Expenditure

We spent slightly more on food shopping than we raised from the daily food charge, but as the expedition fee is intended to partly cover food (especially underground food stocks) this is acceptable. With this in mind, I recommend the food charge is maintained at € 1.50 per day, and continue to encourage that this is paid in cash, and set a price in GBP of £ 1.50 per day to encourage payment in EUR (adjusted for exchange rates at the time of the expedition).

Hut supplies are not a major drain on the expedition finances; the hut equipment was improved this year with the addition of large pots, a second large burner, and piping to join the two large drinking water tanks. We pay expenses to the Wiesberghaus for cooking gas cylinders, waste collection and most significantly the use of the Seilbahn which is of considerable inconvenience to the Wiesberghaus but is nonetheless provided at a preferential rate for which we are extremely grateful.

The bulk of the expedition spending is on caving equipment and supplies, which includes rope, hangers, maillons, tents, gas cylinders for underground. This is despite the considerable support given by our sponsors, and makes up the bulk of the expedition fee for each participant.

Some small fuel contributions were paid to members who brought out a significant quantity of expedition food or equipment.

7.3.3 Future spending

Regarding hut expenditure, a few small items will still need to be purchased for next year, but expenditure is likely to be similar or smaller. The 12 V lighting installed in 2017 could be extended to other areas of the hut, and potentially powered with solar panels and chargers provided that costs are not excessive.

We purchased more caving equipment this year than in 2017 as stocks had dwindled or been emptied, and we now have some equipment stores of rope, maillons and hangers but there are a number of other items that will need to be purchased. We do now have equipment for another deep underground camp.

However, at some point the expedition may need to re-rig a major cave such as WUG Pot with new ropes, and potentially new stainless bolts and hangers. This will incur a major expenditure on ropes and equipment outside of a typical year's expedition spending. It is therefore prudent to ensure that sufficient positive balance is maintained each year to account for this; I recommend planning for a spend of £ 2,000 every 5 years, or £ 400 per year under normal circumstances. However, since WUG Pot may need re-rigging sooner rather than later (possibly as soon as 2020 or 2021), this may be insufficient in the short term.

7.3.4 Net balance

The GBP account has seen a net increase of £ 873.94.

The EUR cash float is reduced from last year, but is still sufficient for the next expedition, particularly as better stock-taking and records means more shopping can be bought in advance

rather than having to restock dried essentials such as pasta and rice during the expedition (and reimburse people in cash).

Setting the GBP account increase against the EUR cash float decrease, the net increase in expedition funds this year is approximately £ 700. While this is approximately 25% of the expedition fees paid, or 19% of total income, as described in section 7.3.3 it is important that we rapidly raise sufficient funds for a complete re-rig of WUG Pot. This re-rigging may be necessary on the next or subsequent expedition. For that reason, I recommend that the expedition fee be maintained at the current level for now, although there may be some scope for discounts for worthy causes on a case-by-case basis.

7.3.5 Conclusion

This year's expedition has left us in a better state financially than last year, with a new bank account giving easy and rapid access to expedition funds as required. We have sufficient EUR cash to operate as a float during the next expedition, and hold £ 1,224.43 in the GBP bank account which can be used for the next expedition. It is normal for a proportion of expedition fees to arrive too late to be of use for that year's expedition, and so holding a cash reserve is necessary in order to be able to fund the expedition. This amount could also be used to fully or partly fund a re-rig of WUG Pot, although this would depend on sufficient expedition fees being paid in advance to ensure the expedition remains solvent.

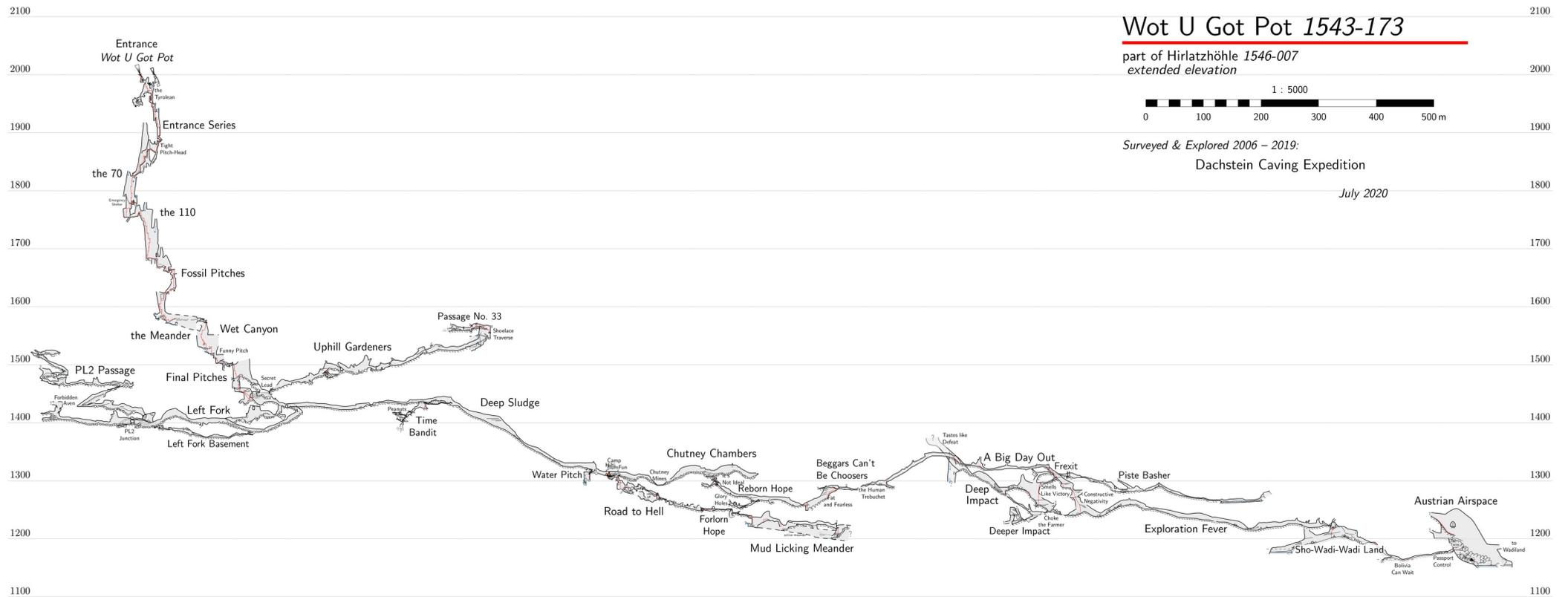
I recommend that the next expedition's fees remain at the same level as this year.



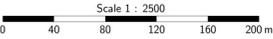
Figure 33: The Dachstein in the Mist (P McCarron)

Appendices

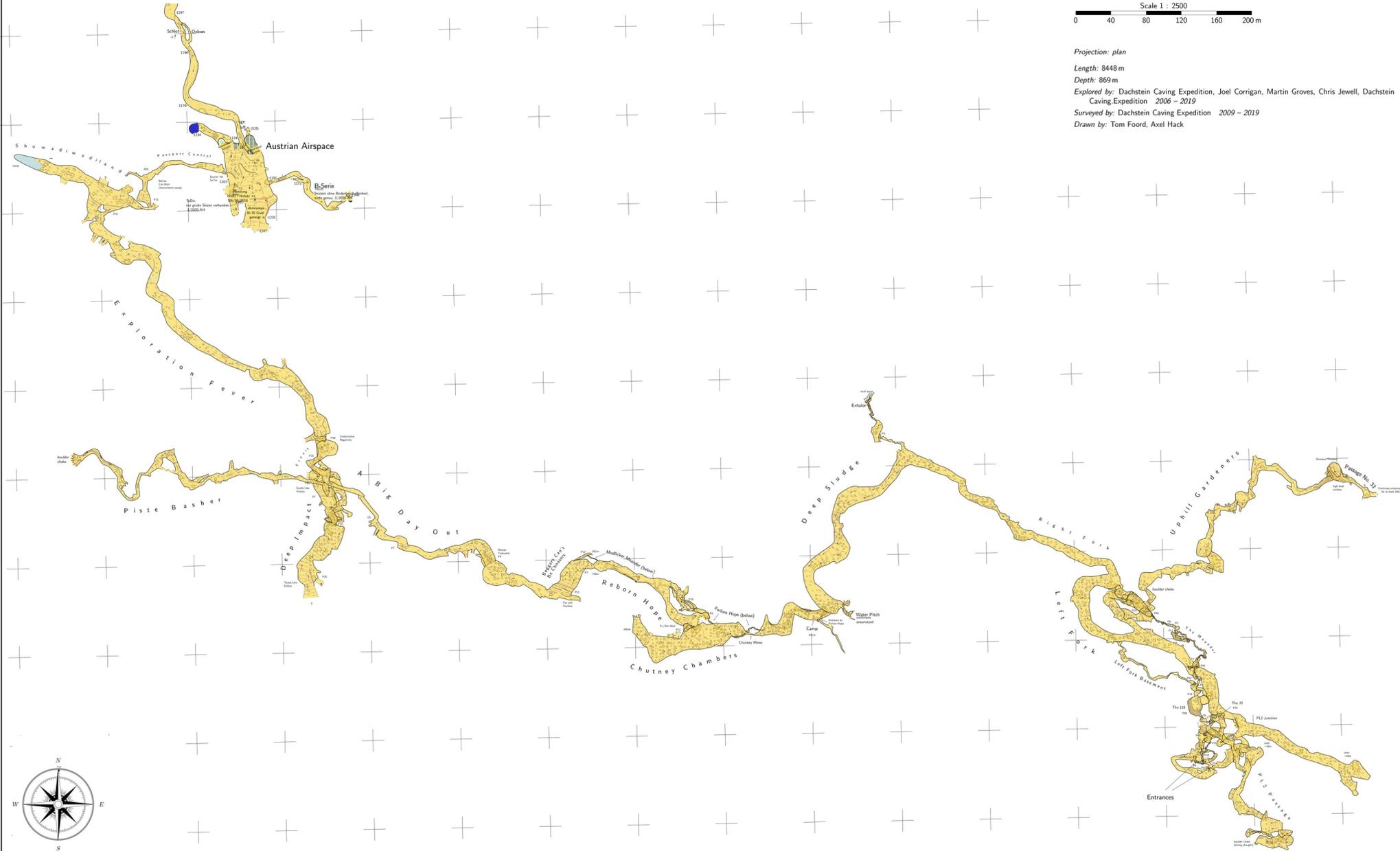
A. WUG Pot Survey



1543-173: WUG / Schmelzwasserhöhle



Projection: plan
Length: 8448 m
Depth: 869 m
Explored by: Dachstein Caving Expedition, Joel Corrigan, Martin Groves, Chris Jewell, Dachstein Caving Expedition 2006 - 2019
Surveyed by: Dachstein Caving Expedition 2009 - 2019
Drawn by: Tom Foord, Axel Hack



B. Tiger Trap

C-106 Tiger Trap

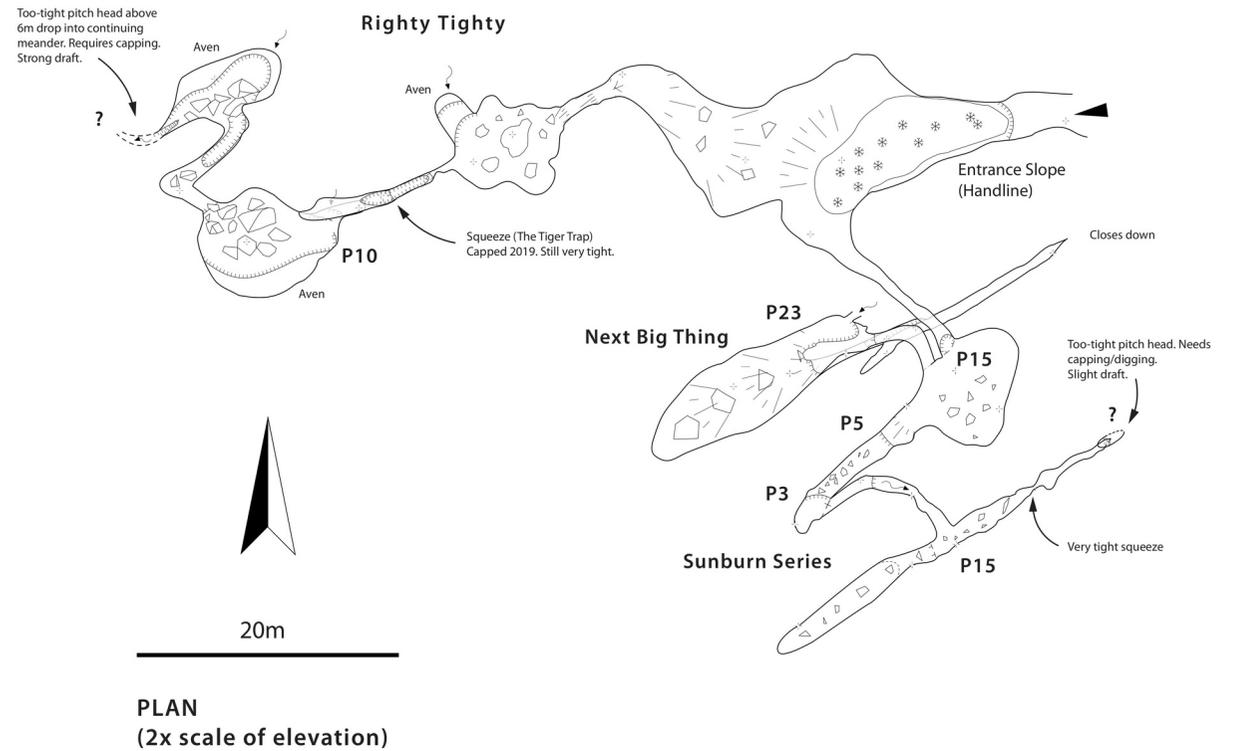
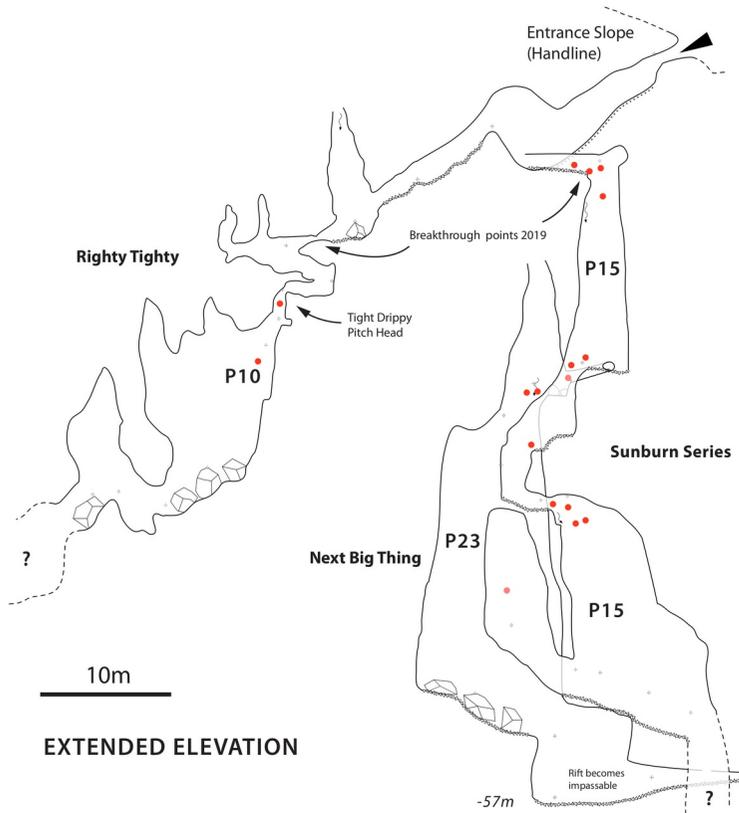
Length: 213 m
Depth: 57 m

Surveyed by: Adam Prior, Emily Punzalan,
John-Paul Wallace, Petie Barry 2018-2019

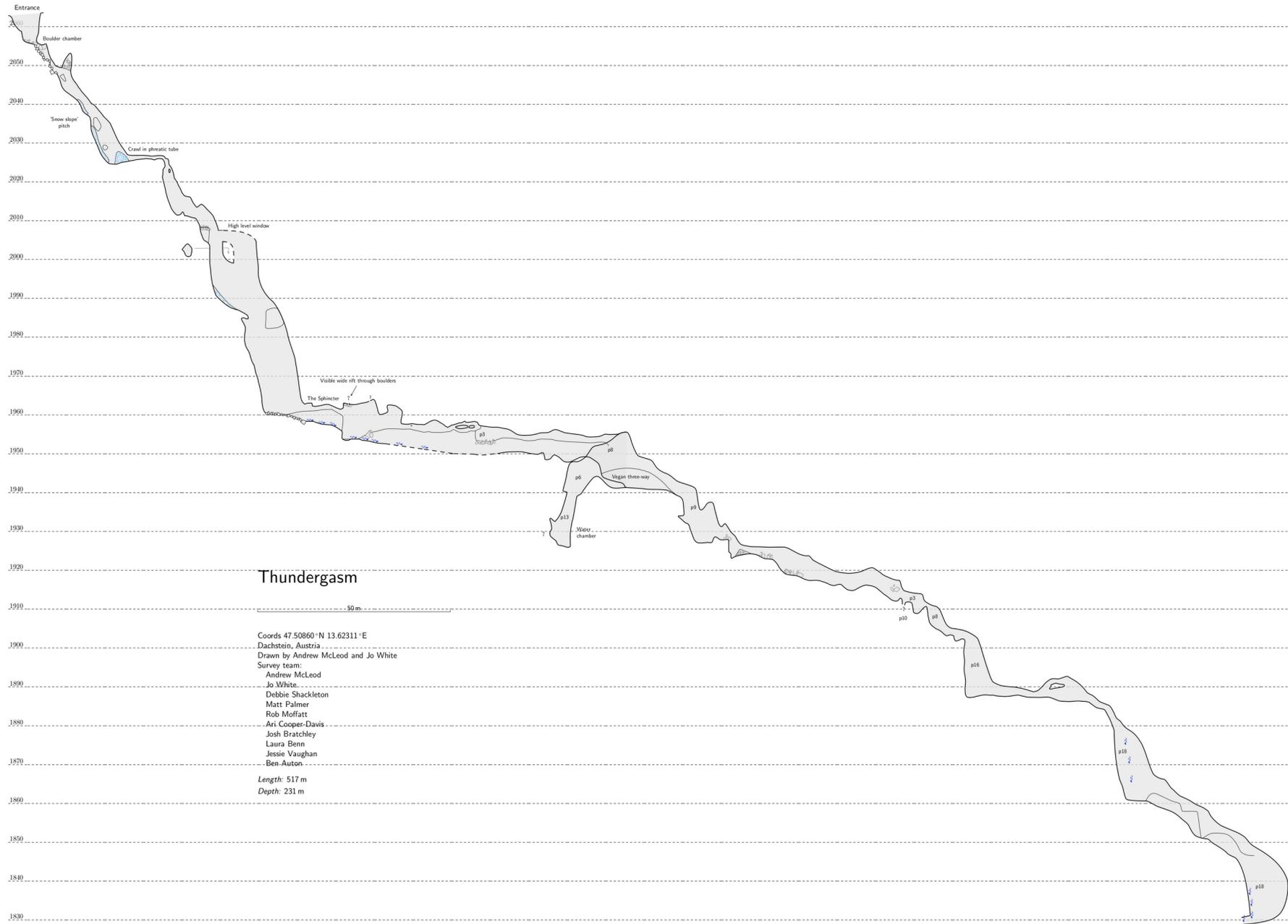
© Dachstein Caving Expedition 2019

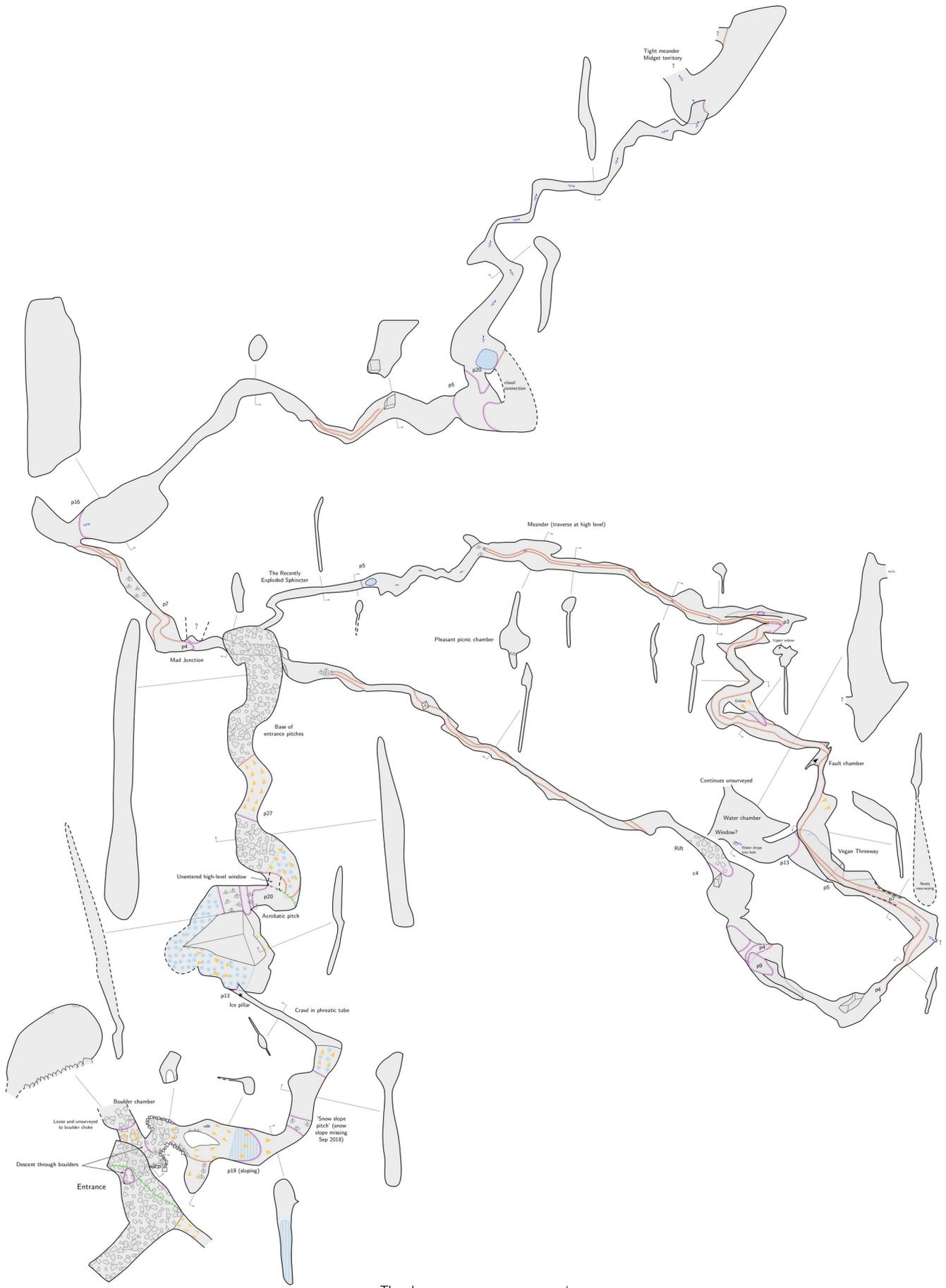
Legend

	temporary survey station		chimney
	entrance		slope
	wall		rock border
	underlying wall		rock edges
	presumed wall		through-bolt (placed 2019)
	pitch		snow
	ceiling step		water flow



C. Thurgasm survey





Thurgasm

10m

Coords: 47 50860 N 13 62311 E
 Dachstein, Austria
 Drawn by Andrew McLeod and Jo White
 Survey team:
 Andrew McLeod
 Jo White
 Debbie Shackleton
 Matt Palmer
 Rob Moffatt
 Ari Cooper-Davis
 Josh Bratchley
 Laura Bates
 Jessie Vaughan
 Ben Austin
 Length: 517 m
 Depth: 231 m