Windless Bight

29 November 2011 at 12:30

Hi all

Last time I wrote, I was sitting in McMurdo station, in the famous Crary lab, about to leave for Windless Bight to do some field work. Now, almost three weeks later, my hair is a little longer, my beard is a little thicker, my clothes are a little dirtier and I am back in Crary lab feeling good about a job well done. So here is how it all happened:

Just to recap, the aim of our project was to drill two holes of about 200m in the McMurdo ice shelf and put fiber optic cables in the holes so that we could measure ocean temperatures beneath the ice. We got given two big orange tuckers to drive out to the sight (It is hard to explain exactly what a tucker is to someone who has never seen one, but it is sort of like a mixture between a pickup truck and a tank, and when you drive down the road in a tucker you demand respect). David and Victor set out to the sight one day before me and Scott because we were on Happy camper training (cf last email).

Just before Scott and I were about to leave McMurdo, I had an inspired idea, which would result in much pain and much joy (incidentally never in that order). I went online and found that McMurdo had a store where you can buy hard liquor, provided you are going to a field camp. I filled out the required paper work, and before long, we were in our tucker, on our way to Windless Bight with 2 bottles of Glen Livet, 6 liters of Port and 3 cases of beer. What more could anyone need for a successful two weeks in the field?

The back wheel of our trailer got iced up on the way, and the drive out to the site landed up taking us about 4 hours, even though it should have taken two. By the time we got out to the site it was already late evening and we found that David and Victor had already begun drilling. They had drilled down through 40 meters of ice, and had already begun their dark downward spiral into madness that every core driller knows too well. Over the coming days I too would get to know the madness, jubilation, power and insanity associated with deep ice coring. Long ours of repetitive actions, driving you slowly out of your mind, out of your head, into someone else's, into the heart of darkness, down the borehole, into the ocean, through ice shelf cavity, and back into the drilling tent where Victor would tell you to push the pin, clean the shaft, watch the anti-torque and not to talk to him because talking leads to errors and errors break the drill. Hour after hour of silence and science and concentration, staring at the white walls of the drilling tent, trying to keep thoughts of murder out of your mind, trying not to respond to the voices in your head shouting at you, telling you you don't belong. The pin coming out, the drill coming up, the voices getting louder and angrier. The boredom increasing, the borehore diameter expanding and contracting and breathing and shouting and mocking you. And again the drill comes up, the pin pulls out, the core gets dumped, the walls move in, the tent gets smaller, the voices get louder, the pin goes in, the drill goes down, the walls creep closer, the pressure gets greater, the voices get louder until eventually you snap! And in that moment, you cease to be an ice core-driller and you become a penetrator.

Anyway, when we arrived on site, it had all just begun for David and Victor. They defiantly still had some sanity about then, but after 40 meters of drilling, the first signs of the madness were begining to show. For example, David had taken one of the dish-clothe from the kitchen tent, turned it into a flag and had drawn a hammer and sickle on the flag and declared the drilling tent to be a soviet socialist penetration tent. It was declared that Lenin was alive and was always with us, and people entering the drilling tent were made to salute and occasionally to sing the Russian national anthem. In addition to this, Victor had made an official declaration that only one person could be the drilling assistant for each borehole (since most people ran out of small talk in the first few hours and good drilling requires silence and concentrations and hours and hours of repetition). So, this meant that David was stuck with Victor in the drill tent for the next 4 days until borehole 1 was done and irreparable damage had been done to his psyche. Scott and I would spend the next few days setting up the power systems.

Before I move off the topic of drilling, I must mention one thing, that I am sure the more astute readers have already picked up (warning, the paragraph may not be appropriate for sensitive readers). I hate to be crude, but there is literally no way around it cold hard facts: In the last two paragraphs I used the words: Penetration, penetrator, hole, drill and shaft. In fact, drilling basically consist of putting a long hard penetrator down a tight white and occasionally wet hole, sliding it in, pulling it out, sliding it in, pulling it out and occasionally lubricating the drill bits so that the penetration can be hard, powerful, and fast. In addition to this, sometimes it is necessary to lubricate the shaft and stick the drill in the shaft, before putting it in the hole.... It really does go on and on. There is literally no end to how many sexual reference one can make about drilling. (I was thinking of making a t-shirt saying: "I penetrated 200m of solid ice, do you have any idea what I could do to you?"). For the first few minutes you resist the temptation to smile when your Phd adviser says: "Do we need to apply more lubricant before penetration" (that's what she said?). But after a while one really has to give up and accept that drilling is a rude sport, and if you want to play, you have to be able to roll with the jokes and to be able to look your university professor in the eye and tell him that you are getting quite excited for the second hole because you have always dreamed of being involved in double penetration... etc.

Anyway, enough of that (although it really did last for two weeks, and those joke sound even more vulgar in Russian, which is what we spoke most of the time).

A bit about our location and camp. Windless Bight is in the middle of a huge white plain on the McMurdo ice shelf. If you look due East you have a view of absolutely nothing but flat white distance for a arc of about 160 degrees. It is quite impressive to look in this direction and just see flat nothing for as far as the eye can see. The other directions on the other hand, were much more interesting and very impressive. Directly to the north, stands Mount Erebus which is an active volcano. Erebus stands over 4000m high and we were right at sea level, so it really towers above your head. At the top of the Erebus, you can see the smoke from the eruptions swirling around. To the west, you have Caste Rock and in the far distance you can just make out the windmills from McMurdo station. Finally to the South there are the Black and White islands. This is the storm track, so we spent our time hoping that we did not get winds coming out of the south (and luckily we didn't). Windless bight is quite an impressive spot and is really beautiful. Quite a lot of time was spend gazing into the distance, but ultimately ones attention always got taken by Erebus which is just so mighty and awesome. In our camp, we had 4 mountain tents (one each) to sleep in. Then we had an arctic oven tent, which we used as our dining room and kitchen. We also had an endurance tent which was used as our science tent. Then there was the drilling tent, which was a white TP with picture of penguins on the sides. Finally, there was a bathroom tent and a generator tent. And that was our home for two weeks.

So, as I mentioned before, while David and Victor was drilling the first hole, Scott and I began to set up the power system. Our aim was to have our fiber optic system run for one year. To this end, we go 30 batteries (12V), which we put in three boxes. This was to be the battery bank. In the summer, these would be charged using solar panels since the sun is up all the time. In the winter, the batteries would be charged by a wind generator, since it is dark cold and windy all the time. We had been given instructions on how to set all these up, and we spent the next few days erecting the tower, connecting the panels, finding the pieces for the wind turbine and digging big holes to bury the dead-man. It was quite hard work, but really fun to set up such a system.

In the evenings, we would all gather for dinner. Since it was always light, the term evening is an arbitrary thing. We were all feeling quite a lot of pressure to get our work done quickly, so we were working very long days, so dinner would often be taken just before midnight. Everyone did the cooking now and then, but I landed up doing most of the cooking and without being too immodest, we ate like kings! (although after a long day in the cold, pretty much anything will taste awesome). Meals included: Pasta with pesto, pasta with red sause, pad thai, burritoes, Malaysian laska, salmon teriaki, halibut steaks, chicken and beef (for the non-vegetarians and beans for the more ethical eaters), alfredo and much much more.

During dinner we would all have a beer and chat about the science, and glaciology and drilling and the project. These were the times that everyone looked forward to during the day. One beer would turn into 2 or 3, then the beer would be put away, and the less enthusiastic would go to bed, and we would turn our attention to the whisky. There is nothing like

cold Glen Livet, drank with ice from a core which you have drilled from 150 metes below, which last saw sunshine over a hundred years ago. The ice crackles in the glass and the whisky goes down so dam smoothly. In fact, the whisky goes down way too smoothly and before we knew it, it was 8:00 in the morning again, and David and I were as drunk as a couple of sailors, a bottle and a half of whisky gone, Scott was had stumble out the tent and fallen over the door into the snow, there was a huge sign up on the tent pointing to Mecca and plans for a greenland summer school had been drawn up using permanent markers on pro-vitas (crackers), which we taped together with masking tape. Good whisky really does cause good mayhem.

Then the next morning, we would stumble out of bed at 11:00am, and reach for the tylanol (which David had taped to the Glen Livet bottle as a suggestion for a new marketing scheme). Another long day would begin and you would wish you were more wise the night before and had gone to bed early. Just before dinner you would begin to sober up, and finally be just sober enough to drink a beer at dinner. One beer again turns to 2 or 3. This time the whisky is gone, so we go for the port. The port is sweet and strong and quite nasty. We all agree that it is for the best that the port is nasty because it will mean that we will drink it more slowly and get more work done. Scott and Victor go to bed early. Eight hours later, 2 liters of port have disappeared, and David are roaring drunk, David is giving me a philosophy class on how to stay ahead in science by making sure that your research is inline with what the general public and the scientific community want to know, we have cut out hammers and sickles from cardboard decorate the sides of the tent, one of our gloves is lost so it is decided that the only solution is to wrap tape around the hand to make a glove made entirely from tape. The glove feels good when its on, but is tough to take off. Drilling techniques have been discussed and critiqued at length and Ramandan is declared (and begun), which is a month of only eating Raman noodles. So it seems that bad port gives rise to good mayhem too.

To be honest, the tough days working or drilling after a long night of drinking were a bit hard and painful, but for me the nights were really fantastic and well worth it in retrospect. At Courant, I get one or two hours a month of David's time and try to latch onto every little bit of wisdom that he offers. In comparison, here on Windless bight I would get to sit and chat to David for a number of hours each night, be able to discuss various different topics and a few drinks allows you to ask some questions that you would not usually ask. I really think that I have gained some insights into the prospect of a career in science, all thanks to some good whisky and some cheap port. Also, I have really come to think that David is a fantastic adviser and a great guy. The more time I spend with him, the more I like his attitude towards science and towards personal interactions. I also really appreciate the fact that he really wants the best for his students and how he sees his students as part of his team working to achieve a scientific objective. Its great and it is going to make for an excellent next few years.

Anyway, this email is getting long a bit and I haven't really gotten to the good parts of the story, so I'll cut down to some cold hard facts. The wisky and port lasted 10 days, the beers a little longer. The first borehole was drilled to 180m. During this time, David went a bit nuts. My drilling virginity was taken from me and the second borehole was begun. For 4 long tough days Victor took me under his wing and showed me the ins and outs of coring. 4 days is just enough to make your go out of your mind and need a 5 year break without drilling. We were using a mechanical core drill, so the core had to be removed after each meter (pin out, drill out, other pin out, clean shaft, apply lubricant, pin in, drill in, other pin in, Vladimir stop, pull drill round, lower drill making sure to not hit the anti-torque, wait 15 minutes in silence for the drill to come back up). We drilled this hole down to 180m, then we put temperature sensors in both holes and use the temperature gradients to calculate where how many meters above the ocean we were. Then we drilled to within 5 meters of the interface (which was at 192.7m) and we stopped.

In the meantime, Scott had been preparing his fiber optics for lowering. We wanted to tape a pressure transducer to the cable so that if it swung with the tide we would know how high it swung. The problem here was that the fibers are made out of glass and were very fragile. We tried to lay out both cables, but in the process we snapped one of the cables and aborted the plan. Scott managed to fix the cable by cutting off the broken end, but it was a high stress situation.

Finally we arrived at d-day (deployment day). We could not penetrate into the ocean with the coring drill because the salt water is too conductive and would make it fail. Victor has invented/designed a hot point drill (insert joke here), which is

just a metal stick where the end gets really hot and melts through the ice. The idea was that we could melt through the last few meters and into the ocean. This was the most high stress part of the whole expedition because it was an untested technique and if it messed up, all the drilling could be wasted. For example, if the hot point made a small hole, which allowed sea water to enter, but was not big enough to fit the fiber through, then the sea water would re-freeze in the hole and we would need to start again. We began our drilling and there was a lot of tension. Victor shouted at all of us (including David) and told us that we were distracting and had no place in a drilling tent. Scott could not bear to watch and was running around adjusting his cables. The drill started moving down. My job was to record depth, weight, voltages and times. The drill began to get closer and closer to the interface and the tensions grew. Suddenly there was a sound, Victor yells out that he has lost control of the drill, the salt water comes up and short circuits the power and the generator goes down. Victor yells that he has lost the end, and that it must be stuck. For a moment we all realize we have failed and consider the implications of wasting half a million dollars on a failed project. Then suddenly Victor says: " I got it back". The drill comes up, we all spring to action, the fiber is lowered through the hole and an hour later we are sipping at the last of the whisky (which we had saved for d-day) celebrating a great victory over mother nature.

The second installation was done the next day, and was much smoother with no problems at all. (All the remaining drinks were finished to celebrate the second installation, but by this stage it was slim pickings). Then a few days were spend programing the dalalogger and the iridium phone to save all the data, and to send it via satellite back to NYU. Then the next day, we packed our things and headed back to McMurdo. We were sure that people would be lining the streets of McMurdo to welcome home the triumphant heroes, but it was not quite the case. Either way, it felt really good to get the job done well and we already have bits of data which are looking very promising.

David and Victor flew home a couple of days later and Scott and I are due to leave tomorrow. The whole system stopped working two days ago, but seems to be back online now, so we should leave tomorrow. Ramandan ends in a few days and it will be nice to eat non-raman based foods.

And thus ends my Antarctic adventures for 2011. I must say, I really really enjoyed it and fully intend to come back. In fact, more and more I think that science would make a fine career choice, in which case you could come back every year. Back in McMurdo I heard stories from the "deep field" and I really want to go there, especially to Pine Island Glacier, which is the legendary place with cracks, and crevasses and notoriously bad weather. Sounds awesome! Who knows, maybe an opportunity will come up to go there next year. It is a little depressing that I waited so long to come on this trip, and it is all over so soon, but I guess that's how it goes.

Hope everyone is well and the letter was not too long and over the top.

Cheers
Alon