# Chronicles of Antarctica and New Zealand

Patrick Brown

# Chronicles of Antarctica and New Zealand

# Table of Contents

# Introduction

The winter of 2011/2012 was unlike any other in my life. Snow and ice covered the ground incessantly while the temperature never got above freezing. Yet oddly, it was one of Colorado's most mild winters on record. This seeming contradiction was made possible by the fact that I spent the winter away from home on a scientific expedition to Antarctica followed by a vacation in New Zealand.

It was truly a trip of a lifetime, and I knew how important it was to document the experience for posterity. My family was most certainly intrigued by this rare opportunity, as were my friends who are scattered around the US. Additionally, my colleagues at LASP wanted a glimpse into this foreign world where research is conducted in an almost space-like environment.

Fortunately, I have spent almost a decade honing my ability to share experiences digitally. My website, www.patrickbrown.org (aka digital. stories.), has become a passion unto itself and has provided a medium to share my life while simultaneously exploring the ever changing world of digital media. So when I decided to join the expedition to Antarctica, I also chose to share my experiences on my website. I knew that free time would be scarce and that my readers' attention would be limited, so I planned to write articles on a weekly basis that explored the full range of experiences--my personal take on the trip, descriptions of the continent itself, and explanations of the science. And of course, I wanted to share the experience visually with photography and videos that captured the essence of the far away place.

As my time away progressed, I followed my plan with article after article on my website that garnered significant attention back home. Returning home, I had an amazing record of my time in Antarctica and New Zealand, but it was all contained digitally in a format that is highly flexible but somehow less personal than I desired. Therefore, I decided to capture all of my stories and photos in a tangible book that would provide greater permanence and continuity of my experiences. The book you see before you is the result of this decision along with the significant effort originally required to document the trip on my website. It was an incredible journey to the end of the Earth, so I invite you to join me as I share my Chronicles of Antarctica and New Zealand.

Patrick Brown

Note:
Digital medial (videos, GPS tracks, panoramas, hyperlinks, etc.)  from the original website postings are not contained in this book but can be found at the following addresses:

| | |
|---|---|
| See You on the Flipside | (http://rumitcu.blogspot.com/2011/12/see-you-on-flipside.html) |
| A Kiwi Christmas | (http://rumitcu.blogspot.com/2011/12/kiwi-christmas.html) |
| Antarctic Arrival! | (http://rumitcu.blogspot.com/2011/12/antarctic-arrival.html) |
| A Week in McMurdo | (http://rumitcu.blogspot.com/2012/01/week-in-mcmurdo.html) |
| Ozone Depletion | (http://rumitcu.blogspot.com/2012/01/ozone-depletion.html) |
| Half Way... | (http://rumitcu.blogspot.com/2012/01/half-way.html) |
| Sleepless Sun | (http://rumitcu.blogspot.com/2012/01/sleepless-sun.html) |
| Cape Bird | (http://rumitcu.blogspot.com/2012/01/cape-bird.html) |
| Stranded | (http://rumitcu.blogspot.com/2012/02/stranded.html) |
| Onward | (http://rumitcu.blogspot.com/2012/02/onward.html) |
| New Zealand | (http://rumitcu.blogspot.com/2012/03/new-zealand.html) |

# See You on the Flipside

**Thu Dec 22, 2011 | 08:21 PM |**

Today marks the 2011 Winter Solstice which means the days are getting longer in the U.S., but in my case, the days are about to get *much longer*. Rather than a paltry 10 hours of daylight per day, starting today I am embarking on a journey that will be providing continuous, 24 hours-per-day sunlight! If your physical geography lessons are still fresh in your mind, then it won't be too difficult to solve the puzzle of how I am about to affect this change. That's right, I'm going to Antarctica!


It is going to be a topsy-turvy trip akin to Alice's fall down the rabbit hole during which my 24+ hour travel will result in a complete loss of a calendar day (only 364 days in 2011 for me) and an almost immediate transition from winter to the Austral summer where I will be hanging by my feet upside down on that quirky side of the planet. Apparently, our old friend Coriolis will make the toilets flush backwards and the sun will traverse the sky counter-clockwise. It truly will feel like a upside down, mixed-up Wonderland.

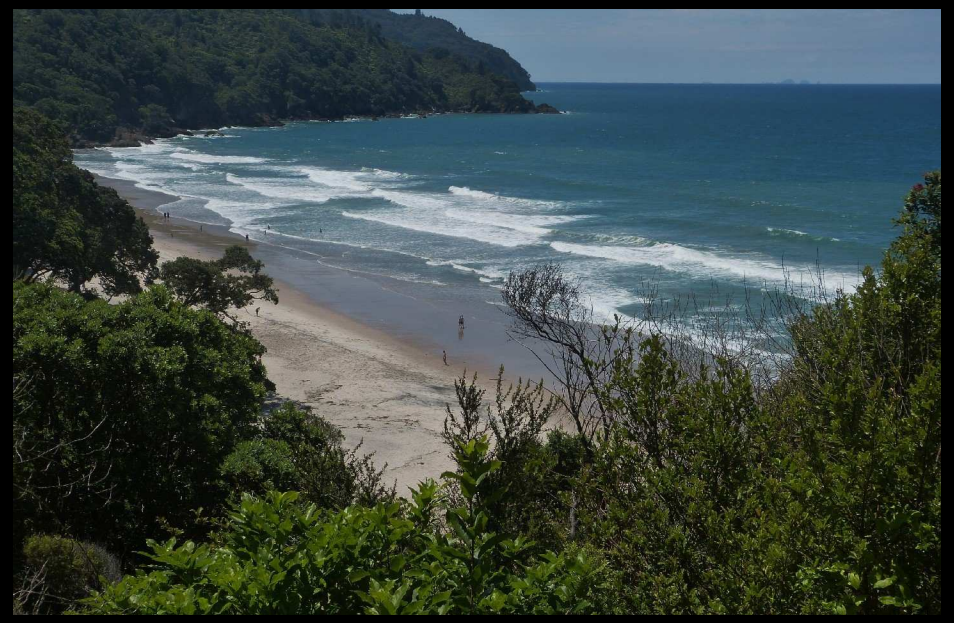
This incredible opportunity presented itself this summer when my friend and colleague at LASP, Lars Kalnajs, asked if I might be interested in joining him and another friend and colleague, Sam Dorsi, on a campaign to install and test ground ozone monitoring stations in remote locations on Antarctica. First off, if these names ring a bell, it's because these two guys are the same characters with whom I launched 3 balloons to the edge of space in 2010! One of the most important lessons I learned from those adventures is the incredible importance of working well with others in challenging situations; and I knew that if I had an opportunity to work with them again in the future, I wouldn't blink an eye. So when this proposal was put on the table, my answer required no deliberation: Of course I wanted to join this expedition to the far reaches of the Earth!

The details of this scientific enterprise will be addressed in future posts, but I'm sure you're wondering where exactly we'll be going, how long we will be going, etc. Our research campaign will be based out of McMurdo Station which is the largest such research station (~1000 people), which by extension also makes it the largest settlement in on the continent, since *Antarctica is a continent of science only!* The launching point for McMurdo is 6 hours north in Christchurch, New Zealand, but international flights only go to Auckland on the North Island of NZ which are 14 hours from LA which is 3 hours from Denver. As you can see, it is quite a journey just to get to Antarctica, but compared to the epic journeys of the early polar explorers, this trip is a breeze. The additional complications of the holiday season helped dictate a slightly early departure from Denver with the added benefit that we will get to explore a sliver of New Zealand over the Christmas weekend before getting down to business on the icy continent. After the quick holiday, we will hop our flight down to Christchurch where we will deal with the final logistics before boarding a C17 military transport on December 28th for the actual flight to the ice. Upon arrival at McMurdo, more logistics and training will ensue before we can finally begin our work in earnest. We will then spend 5 weeks preparing the ozone instrument stations and deploying one per week in remote locations in the vicinity of McMurdo. Then finally in mid-February after the scientific campaigns have been completed, we will fly back to Christchurch where I will vacation with the Kiwis for a few weeks. Finally, in mid-March I will return home to Colorado.

My departure from Denver is imminent, and I must admit that the build up to the trip is like nothing I have ever experienced. I have pored over books and movies of the Great White South, and have pictured myself a thousand times on the exotic continent of Antarctica. In my mind, this is the trip of a lifetime and is like going to the Moon or Mars to me. And like the pioneering polar explorers, the Apollo astronauts, and the Mars rovers, I aim to document my experience to my full capacity. My gear packing is short on clothes, but long on electronic gadgets. I have no fewer than 6 GPS devices, 5 cameras, 2 panoramic time lapse rigs, and a fully autonomous unmanned aerial vehicle (UAV) with onboard video that I will be exploiting to the fullest to capture my experience of Antarctica. This adventure will certainly be the essence of my website title as I share my stories and explore technological means of sharing those stories.
-PB-

# A Kiwi Christmas

**Wed Dec 28, 2011 | 12:33 AM |**



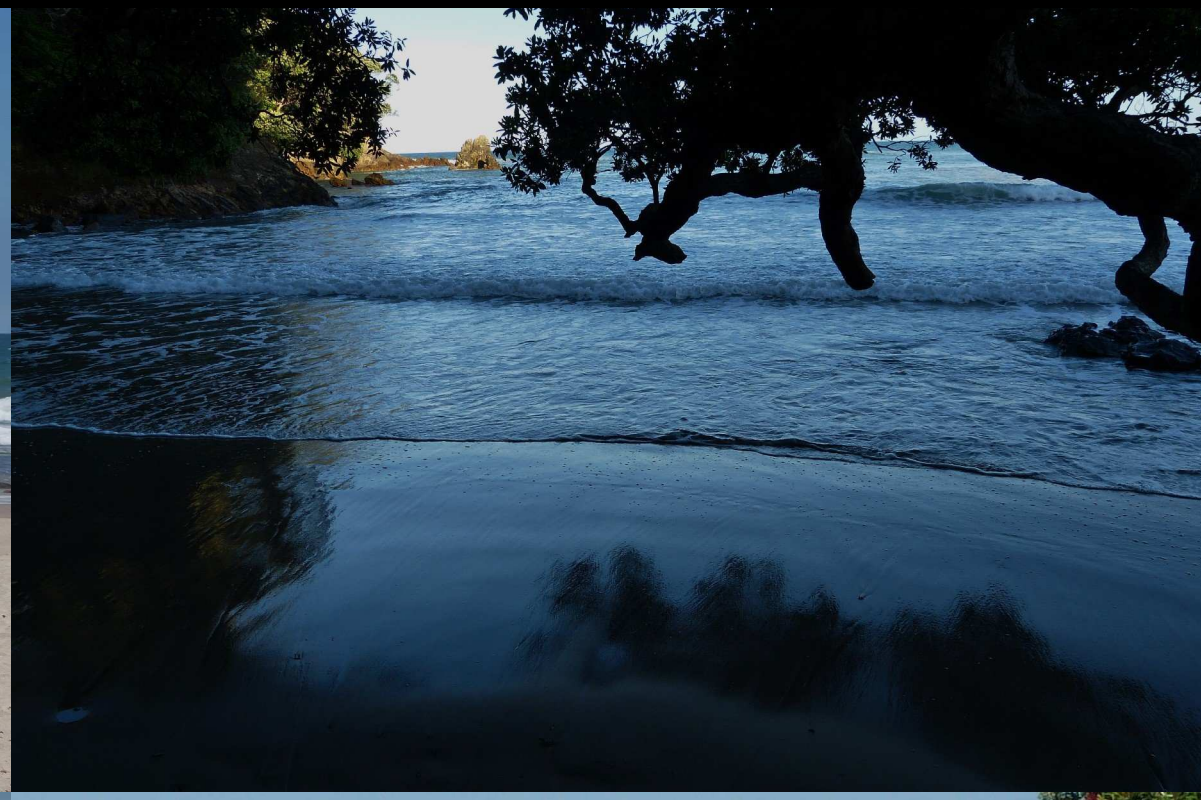
This holiday season, I feel great sympathy for Santa Claus and the extreme journey he takes around the globe each year as he delivers presents to all the children of the world. My own journey may not have been quite as arduous as Saint Nick's, but traveling half way around the world for over 24 hours straight at Christmas time was still quite ambitious and worth every minute. Instead of finding neatly wrapped presents under a tree in my living room, my gift was a few days on the warm sand of New Zealand under the indigenous Kiwi Christmas trees!

This brief pit stop on the North Island was a great way for Lars, Sam, and I to take some personal time and break up the long monotony of air travel on our way to Antarctica. We arrived in Auckland midday on December 24th after losing a day at the International Date Line and proceeded directly to Waihi Beach at the north end of the Bay of Plenty. This sleepy beach town was in the midst of experiencing exceptionally nice weather which made the stunning coastline appear all the more breathtaking. The laid back attitude of the beach town was easy to adapt to during our first day, and we continued to enjoy this easygoing life on Christmas Day during a gorgeous hike up the coast to another cove and a tropical waterfall. Kiwi families were out and about on the trails and beaches after celebrating Christmas at home in the morning which was an interesting contrast to our usual expectations of a Christmas afternoon spent in the snowy North.

Colonial British countries, including New Zealand, have instituted a holiday immediately following Christmas called Boxing Day. Apparently this day's name is derived from boxing up donations to send to charity after experience great wealth the day prior, but I think it is more likely just a great reason to keep the holiday season momentum going. Our last full day of vacation was spent celebrating Boxing Day with throngs of tourists and locals alike at a curious natural feature up the coast on the Coromandel Peninsula called Hot Water Beach. The ocean's edge in this location just happens to coincide with a geothermal site that heats subsurface water and drives it up to the surface much like the thermal pools in Yellowstone National Park. However, the exact locations of the hot springs are limited to a few hundred square meters and are only accessible within 2 hours of low tide, so when tourists descend on Hot Water Beach, they do so in throngs. And when you add the fact that it was Boxing Day when we visited this attraction, you can only imagine the mad scene that ensued. In fact, the experience was both simultaneously hectic and ordered in the way of a beehive. After I caught a few waves on a rented surfboard, I perched my GoPro on a precipitous cliff high above the scene and captured a panoramic time lapse that did a nice job of conveying the natural and cultural oddity of Hot Water Beach.

We knew that our days on the beach were limited, and this morning we parted with the Bay of Plenty for a quick, 1-hour flight to Christchurch on the South Island which is our launching point to Antarctica. Upon arrival at the Christchurch airport, we were greeted by a representative from the United States Antarctic Program (USAP) who briefed us on our schedule for the next two days and warned us that aftershocks are persisting from last week's earthquake. The news was not meant to be frightening, but it was a somber reminder of the natural disasters that have struck this city twice in the past year. Although we heard of the damages the city had sustained, we boarded a bus to view them first-hand. Initially, we concluded that perhaps the damage was not as bad as reported, but upon further exploration, we came across a city that looked war-ravaged with closed streets and fatally compromised structures. The downtown was barely passable as a place worth visiting at all, but farther away, the smaller buildings showed less damage. Unfortunately, the city's namesake church was irreparably destroyed in last year's earthquake when its high steeple toppled to the ground, and now construction towers scrape the sky in its absence. On a more positive note, the Canterbury Museum survived these recent natural onslaughts, so we are planning on a quick visit to it and the adjacent, lush botanical gardens tomorrow morning prior to our departure to the cold, white South.

In 24 hours, I will be stepping foot on the most remote, the highest, driest, windiest, oddest, and of course, the coldest continent on the planet- Antarctica! Stay tuned!
-PB-



# Antarctic Arrival!

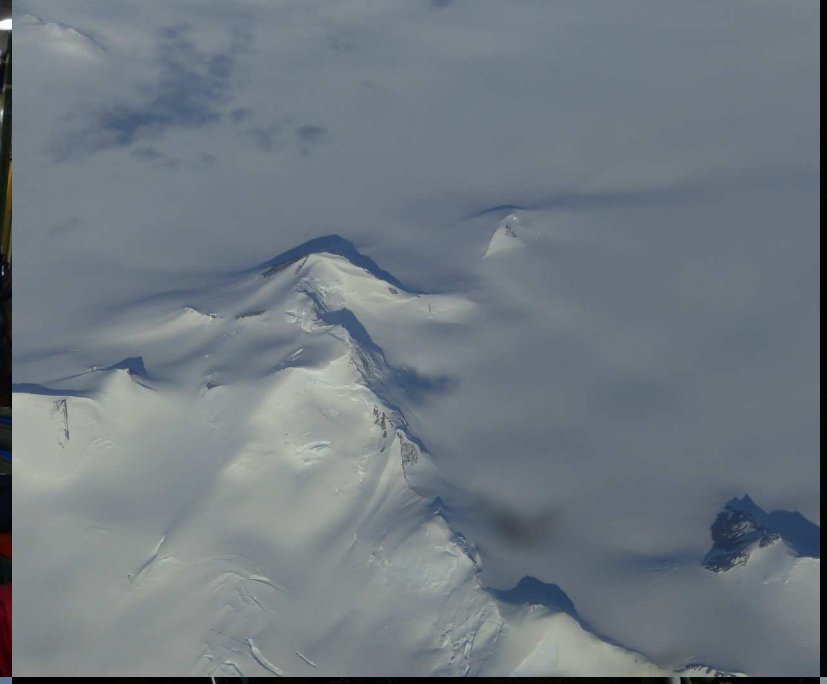
**Fri Dec 30, 2011 | 11:42 PM |**

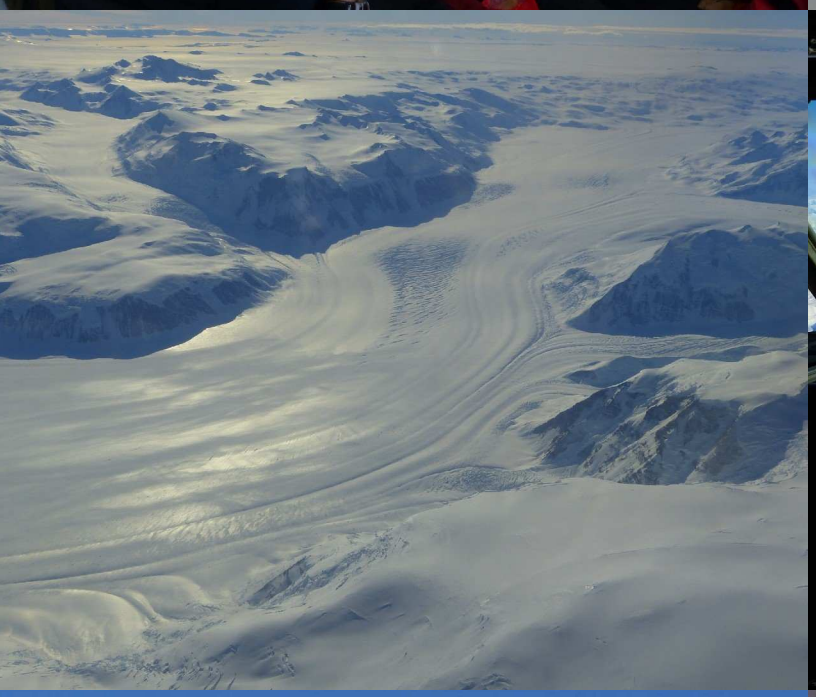
Months of anticipation were finally satiated by our arrival in Antarctica last night! Following numerous flight delays to our previously scheduled December 28th departure due to foggy conditions in McMurdo, we were finally manifested on an LC130 instead of the C17 and the wheels left the tarmac at 1:23pm bound for the Great White South. The propeller-driven LC130 is significantly smaller than the jet powered C17 and is fitted with skis in order to simplify landing conditions on the Ross Ice Shelf near McMurdo, but with a resultant increase in noise and a longer duration flight. None of that mattered to me though; I was on an adventure and completely relished every aspect of the journey.

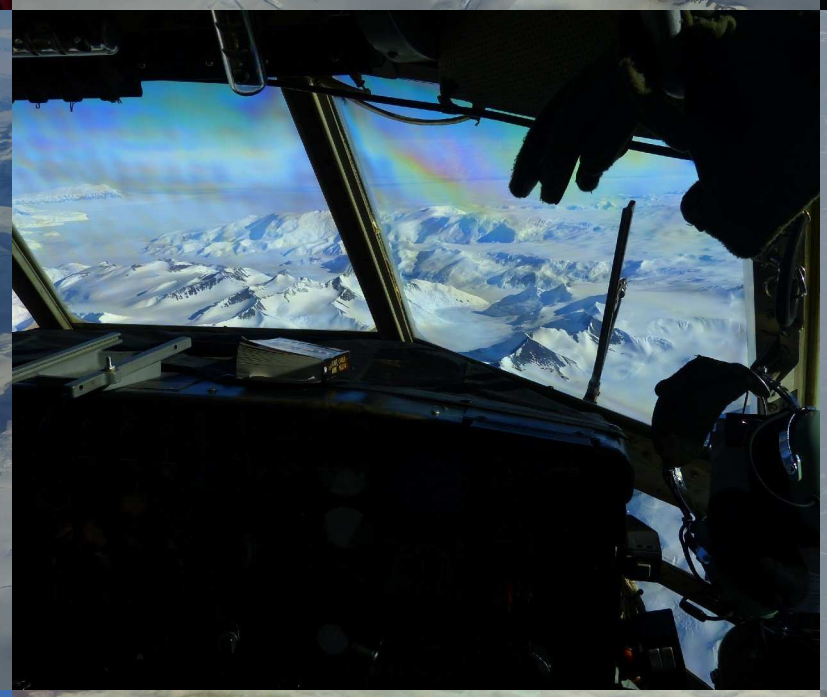
The two dozen passengers sat in jump seats along the inside walls of the plane's fuselage which in combination with our extreme weather clothing (ECW) heightened the sense that we were embarking on a mission of utmost importance. We floated through the skies in the giant leviathan with roaring engines too loud for even a single conversation. The surreal experience eventually gave way to the realization that we were over the continent and closing in on our destination. Shoulders were pressed side by side as we busily fired off photographs of the fractaled ice below through the tiny port hole windows, and we even occasionally had the privilege of joining the pilots in the cockpit for a few minutes of 180 degree panoramic scenery. After 7 hours of flight, we were back in our jump seats and without a view of the approaching ground. The sound of flaps and landing gear deploying was accompanied by corresponding changes to airspeed and aircraft orientation, but it was always nervous not being able to see the ground throughout the descent. Finally, the plane touched down and the graceful landing was subtly punctuated by the sound of skis chattering on the snow. We had made it safely to Antarctica!

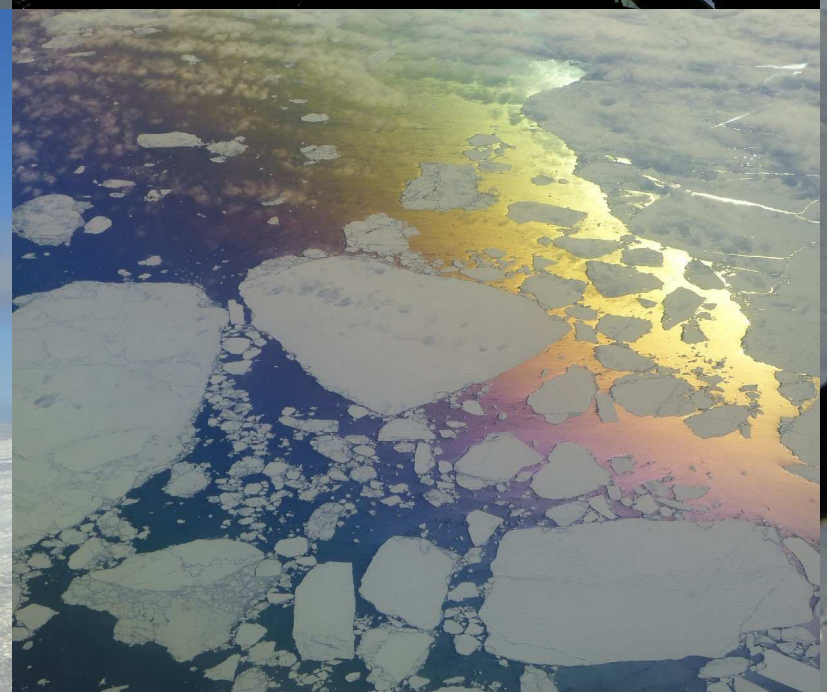
Minutes later, we had all disembarked and found ourselves standing with our very own feet on the Ross Ice Shelf just off the main continent and Ross Island. We slowly turned in circles trying to absorb the surroundings, but there was simply not enough time, so instead we boarded vehicles that would carry us 50 minutes across the ice to McMurdo. The Delta vehicle was an airport shuttle bred with a monster truck and was typical of the vehicle abnormalities that we were about to see throughout McMurdo. As we were cruising slowly down the flagged ice road, our driver suddenly stopped to give us a chance to meet and greet our welcoming party. Two Adelie penguins trotted along the ice in an uncharacteristic location displaying their adorable waddle-run antics. Without a doubt, we had arrived in Antarctica.
-PB-











# A Week in McMurdo

**Fri Jan 6, 2012 | 12:37 AM |**

I awoke to silence and an oddly blue linear pattern of light above my head. Within moments I realized that I was buried under 5 feet of snow and was thousands of miles from civilization on the Ross Ice Shelf, but panic did not set in. Rather, I was filled with satisfaction knowing that I had spent a successful night in a weather-proof snow trench that I constructed the previous evening as part of Happy Camper School.


A week prior, I arrived in the tiny outpost of McMurdo station on the very edge of Antarctica and so far my experiences have varied from the inescapable monotony of trainings and briefings to the unexpected rip-roaring New Year's Eve hoe-down called Ice Stock to productive scientific work and of course to spending two days camping on the ice shelf. My time thus far in McMurdo has left me buzzing from one thing to the next with little time for rest or quiet, but with countless opportunities to observe a world that is both foreign and familiar.

Since Antarctica resides on the dust-free side of the globe and has no entrants in the Olympics, it goes largely unnoticed by most of the world and is regarded as a mysterious land akin to Atlantis or another planet. Assuming you haven't spent your evenings brushing up on Antarctic geography and history, I feel it is worthwhile to provide a little context on this continent. First off, it is a polar landmass that contains the majority of Earth's fresh water ice on an actual continental plate at the south end of the world which contrasts greatly with the Arctic (northern) pole that is comprised of sea ice that is floating on the northern oceans. Second, it is the only continent which has no nations, although seven countries have staked sovereign claims to various longitudinal slices of the continent. This, combined with its extreme weather, lack of significant indigenous fauna and flora, and remote location have rendered it a continent of almost zero population. The people who do spend time on the continent are typically here for one of two reasons: to conduct scientific research or to support the scientists. Experiments are conducted throughout the continent in temporary field camps and at a handful of permanent research stations. The United States Antarctic Program (USAP) is a branch of America's National Science Foundation (NSF) and represents the largest presence of any nation in Antarctica. USAP maintains 3 permanent research stations: South Pole Station, Palmer Station, and McMurdo Station. The location of the South Pole Station is equally obvious and awe-inspiring given the extreme cold and isolation; Palmer Station is located on the Palmer Peninsula, which is the long finger that reaches up towards the southern tip of South America; and finally, McMurdo is located almost diametrically opposite from Palmer at the edge of the Ross Sea and 2600 miles due south of New Zealand. Its exact location is on the edge of Ross Island just off the coast of the main continent in a historic location that was readily accessible by sea for the early Antarctic explorers.

McMurdo is by far the largest of the Antarctic research stations with a summer population of 1000 and the largest collection of logistical resources. Prior to my arrival I read several accounts of Antarctica and McMurdo but Werner Herzog's acclaimed documentary,*Encounters at the End of the World*, made the most significant impression on me. I knew that in addition to the obvious natural wonder that I would experience, the societal aspects of McMurdo would be worthy of my attention during my 6 weeks in the small town. Countless times, I heard McMurdo described not as an exotic glaciated camp but as a grimy mining town you would expect to find in Alaska. If fact, this is a wonderful description, but its worth noting why this is the case. The specific site is on snow-free, solid volcanic land that is adjacent to sea ice that melts every summer providing seafaring access to resupply ships, and if you are looking to build permanent structures in Antarctica, those are two of the best characteristics you could hope for in a station site. Furthermore, although Ross Island is not technically connected to the main continent, it is effectively attached via the permanent Ross Ice Shelf that permits year-round ground travel to other locations. While the town setting is not particularly attractive, Mount Erebus (12,448') dominates the view looking back along Ross Island while the TransAntarctic mountain range occupies the space above the sea shelf and sea ice in front of town. Without a doubt, the views are stunning.

The town itself is an eclectic mix of buildings that seem to be haphazardly placed on the volcanic rock as if tossed out by Erebus itself. Dormitories, two small bars, the Coffee House, a gymnasium, the Chapel of the Snows, and the galley all compete for the resident's free time, but the business side of the station dominates the area. The station's center piece, the Crary Lab, is the heart of the Antarctic scientific community and is proudly built on the hillside looking out at the TransAntarctic Mountains. It is a state of the art laboratory with technical resources, labs, and office space for the hundreds of visiting scientists who base their research in McMurdo and who use the town as a launching pad for the remote field camps.  The station has the feel of a university campus crossed with a military base and there are

signs of this everywhere. Moving away from the university-esque Crary Lab, you find an entire support infrastructure right before your eyes with no place to hide on the bare volcanic grounds. Pipelines zigzag above ground to massive fuel tanks with millions of gallons of diesel, gasoline, and jet fuel while others carry waste heat to buildings and yet others carry waste liquid to the water treatment plant. Heavy equipment continuously drives the same dirt streets that residents walk on and provide support to three airfields on the ice and a heliport in town. There is a completely raw feel to it where science is the esthetic and architecture is not even an afterthought.
power.

Within a day of our arrival, I had already met two of the residents who were prominently featured in *Encounters at the End of the World*, and I was excited to explore the social aspects of McMurdo myself. With great fortune, we showed up in town to crystal blue skies and balmy, 32 degree temperatures that provided an ideal environment to celebrate the coming of the New Year at the station's biggest annual party, Ice Stock. For over 6 straight hours, bands rocked atop a temporarily erected tractor trailer stage while hundreds of folks danced and partied like it was the last day of the year. Each of these groups demonstrated surprising talent and at least as much initiative as they pulled together musicians from the McMurdo ranks with a wide array of instruments to entertain the troops for just one day a year. The faces of these musicians were among the first I saw at McMurdo, and I feel a bit like Herzog as I encounter them dishing food and sweeping halls since I have seen a side of them that draws their passion like their day-to-day job can not.

And in a particularly Herzogian encounter right after Ice Stock, Sam and I met two residents who spend their spare evenings running the local radio station and were thrilled to share the radio business with us. We wandered down the hall from the galley with Matt and Tristen and right into the live radio booth where Matt promptly interviewed me and Sam queued up Neil Young. While that was a real treat, things then got really interesting as they described the McMurdo vinyl record collection that was provided ages ago by the Air Force Radio and Television Service (AFRTS). With the advent of digital media, all AFRTS vinyl collections were slowly phased out and destroyed over the years and now the sole collection in in existence resides in McMurdo. Apparently, the only reason it has survived is that all garbage must be shipped back to the states from Antarctica and the cost of shipping the record collection has been considered to be too large. However with limited physical space around town, there is a looming threat that the collection will meet its demise in the near future and this history will be lost forever. And this is where the encounter took a great turn; Matt and Tristen would like to see the vinyl collection maintained as historical records and are working to see if they can receive an appropriate protected status that allow this Antarctic oddity to survive well into the future.

Our days are typically filled with the business at hand which will quickly turn to several helicopter supported day trips to remote locations to install the ozone instrument network in the field. However, regulations will not let you go to the field without proper survival training for this harsh environment, so Sam and I were required to attend a two day class that is affectionately called Happy Camper School. After a morning-long classroom session, our class of 10 students and one instructor boarded a monster truck-esque shuttle vehicle and bounced 4 miles away from McMurdo and out onto the Ross Ice Shelf. From there we hiked another half mile to a desolate location with dead flat snow for miles in every direction and began our training in earnest. We established a temporary camp where we erected tall, pyramid Scott tents whose design has not changed in a century, and then proceeded to construct a chest-high snow wall as a wind break. The wall was composed of perfectly rectangular chunks of styrofoam-like snow that were literally cut from the ground using a hand saw. The uniform composition of the snow is like nowhere else on Earth and it was amazing to use snow in this way without any additional compaction or treatment.

After we established that we could provide simple camp for ourselves, we were offered extra credit. As we were building our wall, the instructor had been quietly digging out an 8 foot long trench that looked frighteningly similar to a human grave, and then he proceeded to tell us that if we wanted to, we could sleep in one of these snow trenches instead of our perfectly good tents. This all sounded pretty ridiculous to me, but to be fair, the usual goal of a snow trench is to provide an emergency shelter that is free from the deadly effects of high winds. After a few minutes of hand waving instruction on how to finish building a snow trench, he left us to fend for ourselves for the night. Never one to shy away from I challenge, I grabbed a shovel and spent the next 4 hours shoveling away until I had a comfortable sleeping chamber free from the wind, but covered in blocks of snow that seemed to be precariously suspended above my head. However, once I moved into my abode and spread out my gear, it took on the feel of a nest and I slept soundly throughout the night. The following morning, we broke camp and proceeded learn about VHF & HF radio usage and practice scenarios. The scenarios were not only instructive, but quite entertaining as we attempted to contact the South Pole using Korean War-era radio equipment and then simulated white-out conditions with plastic buckets on our heads. I have always been one who loves to camp, and it's pretty darn cool to be able to say that I am an Antarctic Happy Camper. -PB-


# Ozone Depletion

**Fri Jan 20, 2012 | 12:12 PM |**

Children are known for insatiable curiosity that manifests itself with endless questions of, “What is that?”, “How does that work”, and quite often the simple ponderance, “Why?” Although this behavior is most obvious in our developmental years, I can assure you that adults continue to ask these fundamental questions as I attempt to field responses regarding our scientific mission here in Antarctica.

Apart from the numerous questions I receive regarding Antarctica itself, the most common question concerns the *purpose* of our visit to this southern land. In a word, the answer is: ***ozone***. While the stable, diatomic (O2) form of oxygen is undoubtedly everyone’s favorite atmospheric constituent due to our respiratory dependence on the molecule, its lesser known cousin, ozone, also plays a critical role in our atmosphere. Generally speaking, ozone is created when a single oxygen atom combines with our usual, diatomic (O2) oxygen to produce triatomic (O3) oxygen, better known as ozone.

When you hear the words Antarctica and ozone in the same sentence, you almost certainly think about the infamous “hole in the ozone layer” above the continent. The ozone of this context exists tens of miles above the Earth in the stratosphere and is naturally created when ultraviolet light from the sun strikes O2 freeing up two oxygen atoms that then combine with O2 molecules to create O3. The specific size of the ozone molecule makes it a perfect optical filter for harmful wavelengths of ultraviolet (UV) light from the sun, without which we are subject to intense solar radiation linked to sun burns and even skin cancer. This topic became wildly popular in the 1980’s when the “ozone hole” over Antarctica was discovered and ultimately linked back to chloroflourocarbons (CFCs) that act to catalyze the destruction of ozone back into diatomic oxygen (O2). Subsequent to this finding, CFCs were banned from aerosol hairsprays and spray paint, but the annual ozone hole remains until this day as the CFCs persist in the stratosphere. While the study of the Antarctic ozone hole is a fascinating subject worthy of in-depth study and discussion in its own right, the purpose of our Antarctic expedition has little to do with stratospheric ozone or the ozone hole.

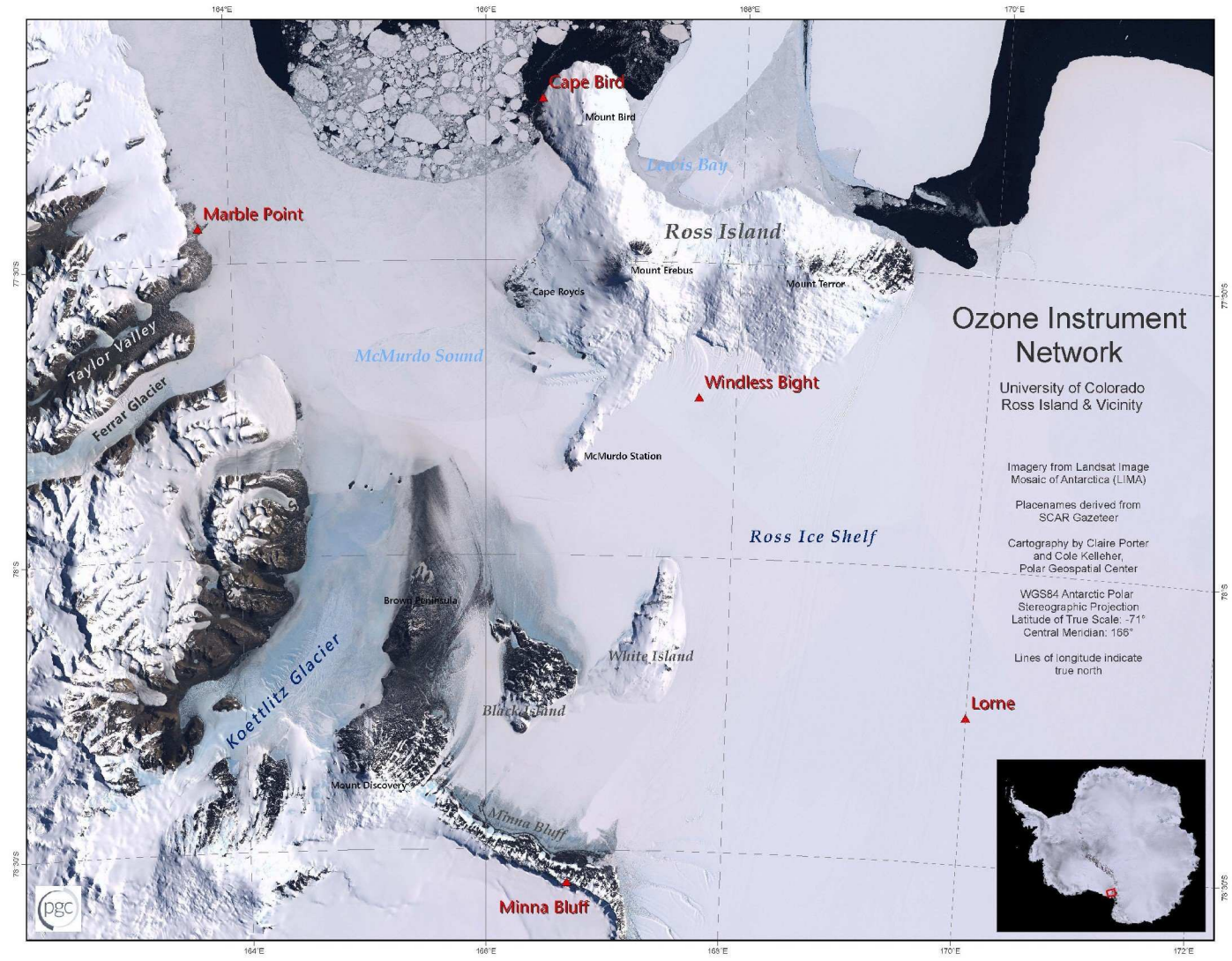
Quite apart from the study of lofty stratospheric ozone, the other atmospheric location of interest for ozone study is in the layer of air in closest contact with the Earth’s surface known as the troposphere. Quite appropriately, it is termed ground level ozone or surface level ozone, and *this is the subject of our scientific study here in Antarctica*. Before considering ground level ozone in polar regions, it’s worth considering what we already know about ground ozone from our own direct experiences. From a sensory standpoint, we are all intimately familiar with the unique smell of newly created ozone after lightning accompanies a rain storm and which we associate with the smell fresh of rain. In a less positive sense, we often heed summertime warnings from news stations who report “dangerously high levels of ozone” and recommend that we fill our gas tanks in the evenings to avoid exasperating the problem.

Once again, although the molecule in these circumstances is identical to the one we are here to study, our familiar context is also generally unrelated to the surface level ozone phenomenon in Antarctica. Our familiar experiences are based on its presence in the mid-latitudes that is defined by a rich, complex environment that is inextricably tied to anthropogenic (man-made) influences. As you can imagine, with such a wide variety of ozone creation sources and depletion mechanisms, it is incredibly challenging to ascertain the exact atmospheric chemistry that is in action. But imagine the antithesis, a location almost entirely independent of anthropogenic effects; a place that feels like the clock was turned back on geologic time scales to an almost unrecognizable setting ideally suited to study natural processes without the complications of the post-industrial era; *this is Antarctica*.

If surface level ozone concentrations were a naturally constant value in the Antarctic, research would have concluded years ago, but as with most interesting stories, there is much more to be told. In fact, previous studies in the Arctic (*northern* polar regions) detected annual springtime depletion of surface level ozone which was later confirmed by short term studies in the McMurdo region of Antarctica. These mysterious depletion events were confounded by the addition of significant Arctic pollution but simultaneously raised eyebrows as direct corollaries to the stratospheric, springtime depletion events of the ozone hole. Furthermore, Arctic surface level ozone has been considered a potentially significant greenhouse gas in the region of the Earth that is most critically linked to global warming. Clearly, a more thorough understanding of this fundamental atmospheric chemistry was needed.

One day, amidst the sweltering summer heat of 2011, I began a conversation with my friend and LASP colleague, Lars Kalnajs, that I expected would follow our usual twists and turns from outdoor exploration to integration of Arduino microcontrollers into our vehicles. But to my surprise, he informed me that he and Linnea Avallone had received a grant from the National Science Foundation (NSF) to perform a first-of-its-kind, long-duration, distributed study of surface level ozone in Antarctica, and then he shocked me by extending an invitation to assist with the field installation of these instruments during January/February of 2012. After confirming my response to join this endeavor, I began to learn about the various scientific and engineering minutia required to perform these measurements.

In particular, previous studies seemed to indicate that the annual, springtime depletion of polar surface level ozone was related to extreme cold conditions near sea ice that allows nonreactive halogens (bromine) to become reactive catalysts for the destruction of ozone in an analogous manner to the extreme cold of polar stratospheric clouds that participate in ozone hole destruction. However, the specifics of whether this destruction was occurring locally, in direct contact with the sea ice or in a distributed manner was simply unknown. This fundamental, spatial question provided the impetus to simultaneously measure ozone across a network of sites that could be clearly understood in relation to each other. Fortunately, the University of Wisconsin operates a large network of automatic weather stations (AWS) throughout Antarctica that suppl y continuous data to atmospheric models of the area. In order to leverage these mature sources of data while providing a spatial distribution away from the sea ice, the instrument network was architected to place four ozone instruments adjacent to existing weather stations.




The instrument location closest to the sea ice is at the northern tip of Ross Island called Cape Bird where it is expected that representative depletion events commence. Then moving away from this source is a location on the main continent called Marble Point for the second station and moving farther along the continent is Minna Bluff for the third station. Finally, far removed from Cape Bird but isolated on the Ross Ice Shelf is Lorne, the site of the fourth station. Each of these sites already consists of an AWS large,steel tower with an anemometer, temperature sensors, assorted other meteorological devices, radio telemetry, a small solar panel, and a bank of rechargeable batteries.

Since the ozone depletion events occur annually and are measured relative to annual baseline values, the ozone instrument must perform measurements throughout the year and on a frequent basis. And unlike the relatively quick and simple measurement methods of the AWS, ozone measurement is far more complex with vacuum pumps, lasers, highly sensitive detectors, and specialized computers that orchestrate the activity. All of this technical complexity is usually encompassed in large, laboratory grade instruments that casually consume gobs of 120VAC wall power. However, on a continent whose environmental superlatives are comparable to that of deep space, instrument design becomes an even more formidable challenge.

The ozone instruments for this campaign were custom designed, manufactured, assembled, and calibrated by Lars himself which is a technical feat considering that such endeavors are typically the products of entire teams of engineers and scientists. And while the instruments are optimized for minimal size and power consumption, they still require respectable amounts of power to run throughout the cold, dark months of the Antarctic winter. Fortunately, the AWS folks and another seasoned polar expert, UNAVCO, have previously addressed these challenges and were able to provide time-tested power system infrastructures for the ozone instruments. In contrast to the unassuming, boxy appearance of the ozone instruments, the power systems are in-your-face with large, aluminum, triangular frames that house two 80 watt solar panels, two compact wind turbines, and two waterproof Hardigg cases. And within these Hardigg cases are 12 sealed lead acid batteries, power distribution and charging electronics, and finally, the piece de resistance, the ozone instrument.

It is amazing that something so small and simple as an O3 molecule could inspire such dedicated efforts and studies, but the need to discover and learn is among our deepest human desires and like the Antarctic explorers who preceded us, huge efforts are clearly required to reach meaningful accomplishments. With each day we spend on the continent, we push harder and closer to our expedition’s goal to deploy the ozone monitoring network, so stay tuned to hear about the progress we have achieved during our time in Antarctica. -PB-

# Half Way..

**Sun Jan 22, 2012 | 09:01 PM |**

My anticipation for this moment had been building for 6 months, yet I found myself in a panic ridden state as the whine of the rotors increased in pitch directly over my head. The immense bulk of my Big Red parka and the Lilliputian dimensions of the cabin restricted my motions while the multiple legs of the seat belt hid themselves in the darkest nooks and crannies of the collapsible seats. Just minutes prior, we received detailed instructions on how to brace for impact and how to cut the fuel in case of a crash. But without a seat belt, there was no way I would survive an impact with the ground and without a helmet on my head, there was no means of communicating with the pilot who seemed intent on take off in the coming seconds. The rotors continued to whir faster and faster and I felt no closer to readying myself for the first Antarctic helicopter flight of our expedition. I clumsily fumbled as seconds seemed to stretch into minutes and eventually found myself securely attached to the aircraft with helmet fastened as the pilot queried the passengers for confirmation of takeoff readiness. Seconds later, the ground slowly fell away from the helicopter skids in a perception in which the helicopter remained motionless and the world moved around it. Slowly, we changed heading, banked, and pitched towards the sea ice and the sensation of motion set in. And so we were off to our first installation in a rush that was reminiscent of the previous weeks' progress.

After a fast paced first week in McMurdo, we settled into a work rhythm that involved repeated construction and disassembly of the four ozone stations. We began our assembly practice on the UNAVCO power system which we had previously constructed twice back in Colorado, and therefore felt confident in its selection as the first system for deployment. On its third construction, we chose to deploy the system to the oh-so-far reaches of the Crary Lab parking lot to assist in field testing its components prior to final deployment to Marble Point. The system was outfitted with two 80 watt solar panels, two 5 watt vertical wind turbines, and a dozen sealed lead acid batteries on its aluminum tubing frame.

Batteries, oh batteries. Although this research project is aimed at understanding ozone, you could easily be mistaken into believing that its purpose was simply to work with batteries. Among the required job criteria was the most important of all- Must be willing to carry and care for 70 pound batteries. The staggering array of batteries was large enough to power a suburban house, and each of these lead beasts had to be measured, charged, and carried countless times before the systems could even be considered ready for installation in the final sites. While the ozone instruments required careful engineering design and scientific insight, the remainder of the system was an exercise of manual labor which simply could not be escaped but fortunately required an expert in battery carrying and charging from someone just like me.

After attending to the endless battery charging and the completion of the UNAVCO power system, we progressed towards our first assembly of the Wisconsin power systems which were previously unknown to us. The Wisconsin systems were almost identical clones of the established UNAVCO versions and we quickly discovered that the alternate design proved no more challenging as we assembled three of the units over the course of the next two weeks. Days filled themselves with the construction of the power systems in the parking lot and then progressed to their disassembly into components that could fit within the tight confines of the helicopter cabin.

As an additional means of testing the ozone instrument, on Saturday, January 7th, we piled ourselves, our cold weather gear, and a test version of the instrument into a tracked vehicle called a Pisten Bully and headed out onto the ice shelf to deploy it in a remote location free of pollutants called Windless Bight. The Pisten Bully is a passenger carrying version of snow cats that groom ski

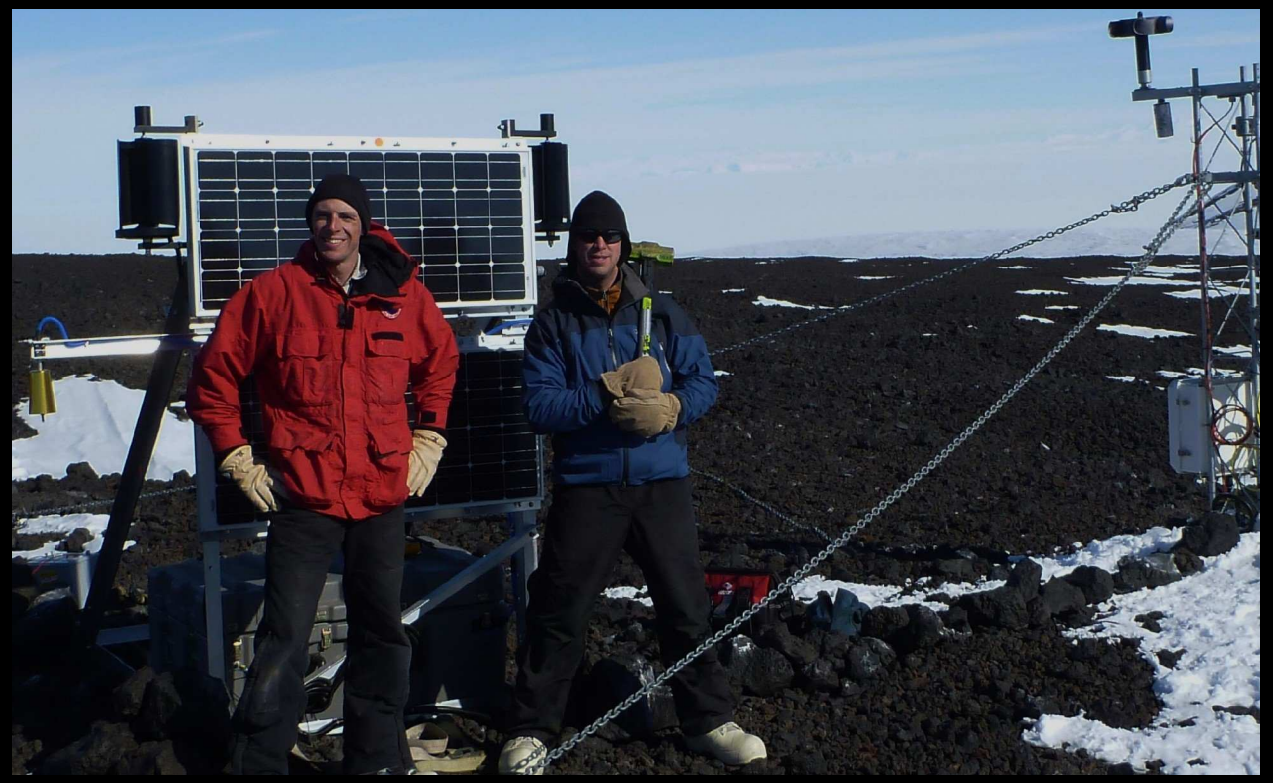
hills and as such can trudge through any snow conditions but at a painfully slow pace. Two hours of rumbling and rattling over the snow later, we arrived at an instrument site on the ice that is configured to detect nuclear explosions anywhere on the globe, and within 30 minutes, the compact ozone instrument was securely mounted and collecting data. And true to form, the test unit proved its worth as its telemetry revealed an issue to Lars a week later back in the comfort of the Crary Lab. If the issue proved to be systematic, it would be important to understand it before all the systems were released to the wild, so on January 18th we set out on another 4 hour excursion in the Pisten Bully to the remote ice location. Fortune was on our side that day as the issue was determined to be fixable in software, and the day's initially overcast weather gave way to reveal the towering Mount Erebus and Mount Terror high above us. Not only did we begin to accomplish our technical goals at Windless Bight, but much to my satisfaction, we also began to embark on our adventures to the ice.

Weeks of travel, hard work, and confined living conditions eventually took a toll on my body as it succumbed to the dreaded McMurdo Crud. During the first days of the cold, I suffered through sniffles and decreasing energy levels but eventually found myself bed ridden on my day off while others frolicked outside in the sunshine. While it pained me to spend my free time sleeping the day away, there was impending reward or punishment depending on how my body responded to the rest, since we were scheduled to fly to Marble Point the following day for our first real field installation.

So after a full day of deliberate rest that allowed me to rally for the occasion, I found myself in that panicked state in the helicopter cabin on Monday, January 16 on my way to Marble Point. The cramped cabin was occupied by our team and another party of 3 and much to my chagrin, I was wedged tightly in the center of the craft where the views and photographic possibilities were extremely limited. Nonetheless, the half hour ride proceeded smoothly across the sea ice and then the helicopter pilot revealed the amazing capabilities of the craft as he glided effortlessly over acres of cliché Martian landscape in search of our desired installation site adjacent to the Wisconsin weather station. After a perfect touch down on a tent-site-sized landing spot, we efficiently gathered our personal belongings off to the side and awaited the arrival of a second helicopter that contained the power system equipment. In a scene reminiscent of the opening to TV's M.A.S.H., we offloaded the equipment from the second copter while its rotor blades continued to spin over our heads. A few minutes later, we had collected all of our gear and the

helicopter departed, leaving us alone on the Antarctic continent for the first time in a scene that we had rehearsed and anticipated so many times. After all of that preparation, the time had finally come to execute the plan.

Methodically, we set about building the frame and then found ourselves executing the one part of the plan we had not practiced already. On a continent known for extreme weather, the power system bears a striking resemblance to a ship with sail lofted, and the last thing we wanted was for the ozone system to be tumbling across the ice sheet like a sad, green port-a-potty on the side of I-80 in Wyoming. Two of the frame corners were near bedrock, so we drilled 1/2” diameter holes and inserted purpose-built rock bolts that provided ideal anchor points. The other two corners lacked bedrock, so we laboriously hammered 1-inch steel spikes a foot and a half into the ground and then attached the 4 corners of the frame to the anchors with chain. With that taken care of, we returned to our usual routine by adding solar panels, wind turbines, and the Hardigg cases to the frame. Then of course, we lugged 12 batteries and placed them in the Hardigg cases and began the careful procedure of electrically testing and connecting each component of the power system. In order to communicate the instrument data with the outside world, Lars connected the ozone station to an existing radio transmitter in the Wisconsin weather station and the instrument was finally powered on. Minutes later, it sprung to life with its familiar pump buzzing aloud just as it had done so many times in the lab before. The installation was complete after 5 hours with an hour to spare before the helicopter returned, so we casually explored the immediate area near the station where I was able to capture a panorama of the scene.



The helicopter arrived on schedule, touched down in the same, miniscule landing zone, and we boarded with no more fan fare than hailing a New York taxi as the rotors whipped around over our heads. I was pleasantly surprised to find a more intuitive seat belt in this helicopter and was quickly fastened with none of the grief I experienced on the previous take off. The aircraft yawed and occasionally bucked in the wind as we cruised 600 feet above the sea ice, and my GPS confirmed the blustery conditions when I discovered that we were proceeding 30 mph slower than the 130 mph speed of the first leg. For the first time, I was able to enjoy the helicopter ride over the relatively featureless sea ice and my gaze out the window eventually discovered long, straight tracks that would eventually lead to seals near holes in the ice. Further inspection of the ground showed smaller tracks that I speculated were from penguins and with a few minutes

remaining in the flight, I spotted 3 tiny penguins waddling their way along the ice. After a day spent in 16 mph, cool wind, I was ready to return home and the rapidly approaching view of McMurdo comforted me until the helicopter wildly swung to the left and to the right as if gripped by the wind itself. Fear began to set in, but I reminded myself that I was in the trusted hands of an experienced, professional pilot. No sooner had the turbulence started than he had the craft back under control for a safe landing. Half an hour later, we were back in the lab and Lars happily reported the first science data from the Marble Point ozone station!

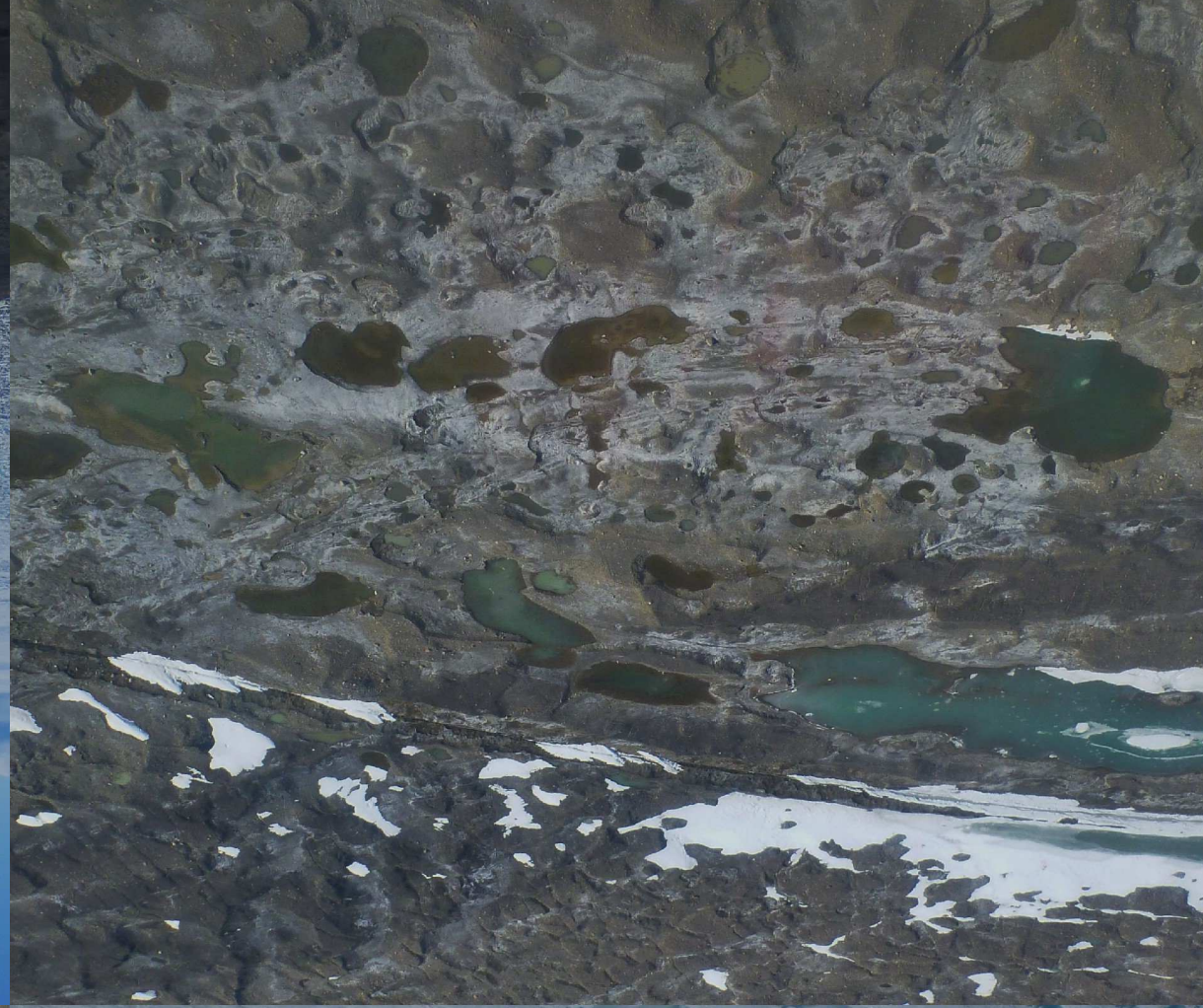
Even with our first field installation under our belt, we didn't rest on our laurels this past week as we disassembled the first Wisconsin frame for scheduled transport to the Minna Bluff site on Friday. But as often happens with flight schedules, Thursday's foggy morning backed up flights and bumped our trip until Saturday, January 21. Only five days after our first install, I awoke feeling that I had finally recovered from the McMurdo Crud and readied myself for the day with a hearty, diner style breakfast consisting of sunnyside eggs, hashbrowns, and toast. And as we waited at the helicopter passenger terminal, I prepped myself by emptying Big Red of superfluous items that would interfere with the seat belt, then donned my helmet ahead of time, and only half jokingly went through the motions of putting on the 4 point seat belt. When the time came to board the chopper, I was ready and we effortlessly lifted off and floated across the dead-still sky towards our destination. The distant location of Minna Bluff necessitated a gorgeous flight path that toured us between White and Black islands and past Mount Discovery. Once again, the breathtaking views were difficult to capture on my camera from my interior seating location, but the experience of flight in such a majestic location was not lessened at all. The search for the actual weather station locations is a game that both pilots and passengers seem to truly enjoy as they buzz the ground and arc the machine in tight circles before finally lowering the skids softly to the rocks below.

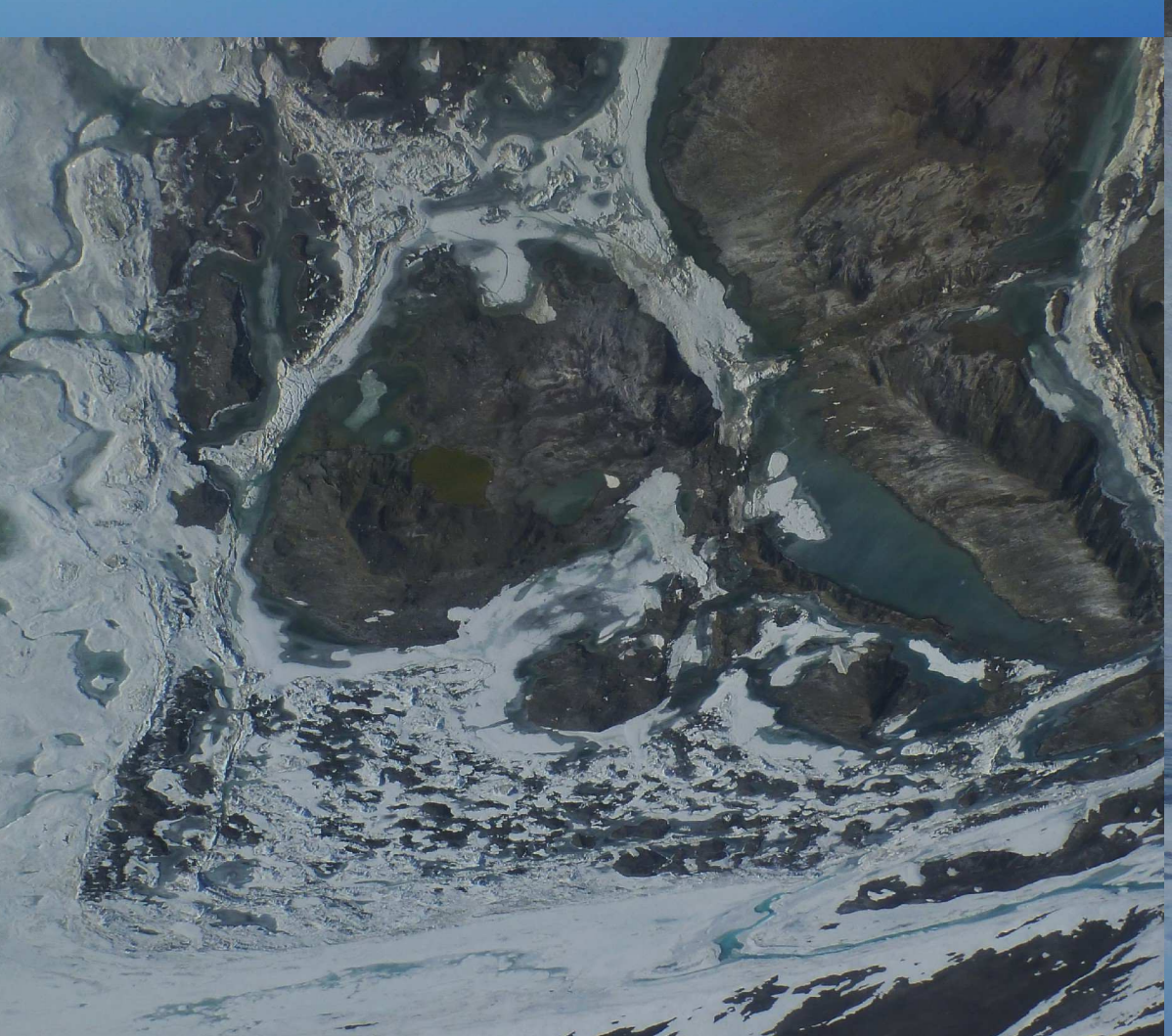
As its name implies, Minna Bluff sits high above the sea ice on a coastline promontory akin to that of the British Isles that leaves it particularly susceptible to high winds that arrive unimpeded for thousands of miles along the continental ice. So whenever we discussed Minna Bluff, conversation turned to the gale force winds that we expected would complicate the installation effort. You can imagine our collective surprise when we disembarked the helicopter to find absolutely still air as reflected by the motionless anemometers on the weather station. Without a complaint, we quickly assembled the frame in the warm sunshine, and I even stripped down to a t-shirt during the aerobic spike-driving task. Our understanding of the power systems and each other became apparent as we efficiently divided tasks and made short work of the assembly. After 2 hours, the system was completely assembled mechanically, so we took a brief walk to the bluff's edge where we enjoyed our lunch and views of endless white that eventually lead to the South Pole. Two hours later, the entire

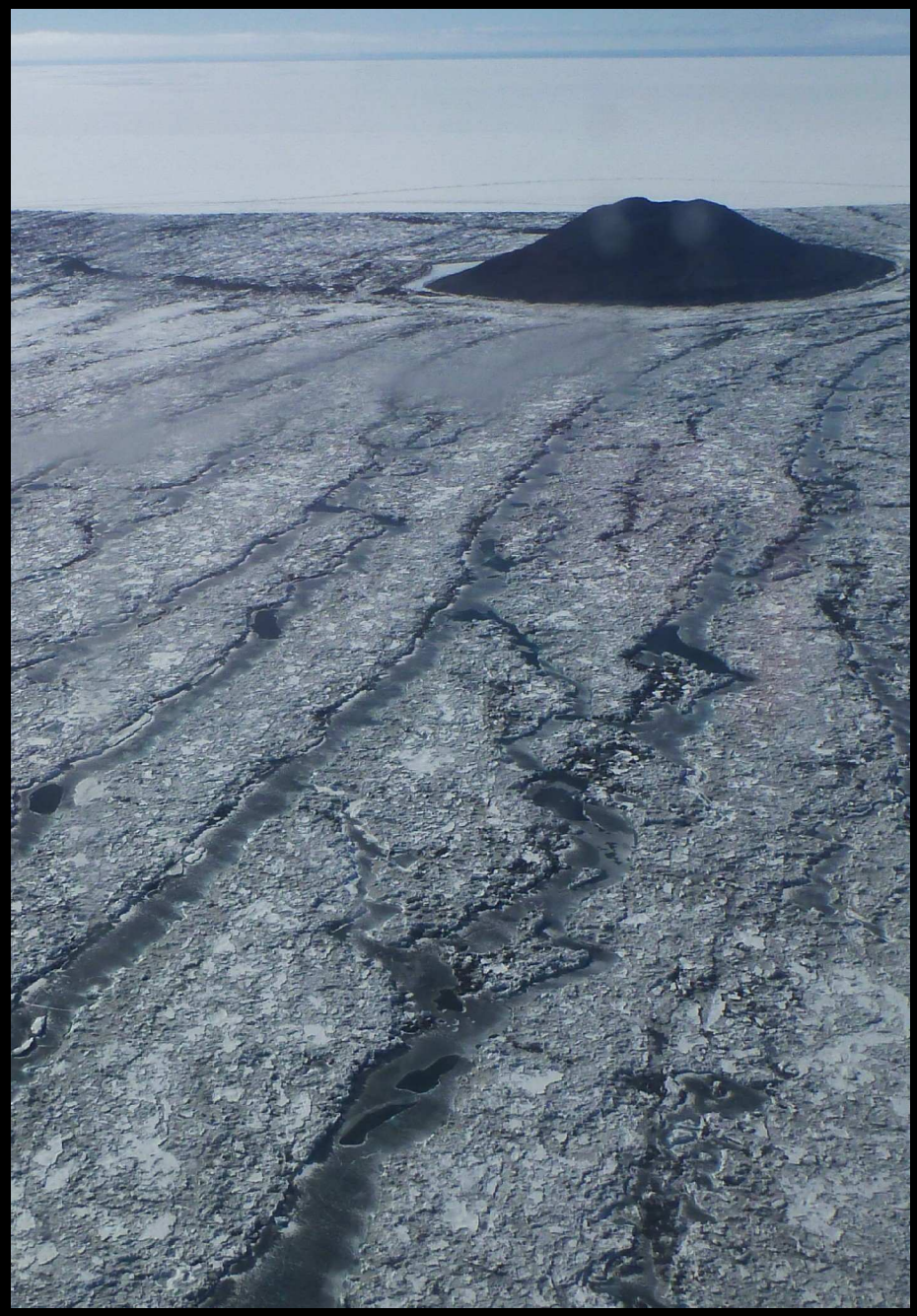
system was up and running and the wind had still not increased to more than a slight breeze. The fortunate conditions and early completion afforded us an opportunity to explore a little farther to another ridge point half a mile away where we took in the views and I shot another panorama.

The efficient helicopter schedulers decided that our return flight could be combined with that of two more scientists up the coast, so after lift off, the helicopter followed an entirely new route along the termini of the famous Dry Valleys. With an empty helicopter, I was finally able to select a window seat and wisely chose the left side that provided views of my namesake Brown Peninsula and amazing glacial melt pools below. The other two passengers had spent the day surveying an area called Cape Chocolate, and the pea sized gravel bed provided no challenge for the pilot who easily set the craft down in the exact skid marks of his previous landing. In the air again and on our way back to McMurdo, I was amazed by the artistic, fractal patterns on the sea ice and happily took advantage of my excellent vantage point with nonstop shutter clicking of my camera.

The warm, still air of the late day provided an effortless landing in McMurdo and minutes later in a tradition that will hopefully continue, Lars was able to report that he received science data from the Minna Bluff station and all was well! With our stay in Antarctica at exactly the half way point, it is encouraging to know that we have successfully completed half of the ozone station installations. We are certainly breathing a little easier, but there is more adventure so stay tuned…
-PB-







# Sleepless Sun

**Sat Jan 28, 2012 | 03:34 PM |**

While there are many unique aspects of the Antarctic environment, one of the most interesting that it shares with the northern pole is its preponderance of sunshine during the summer months. For the majority of people who have spent their entire lives in the mid-latitudes with its daily cycle of light and dark, it is difficult to imagine a world without darkness. In an effort to share this unique place with those at home, I decided to see if I could somehow capture the endless light that we are bathed in each day in McMurdo.

Since the sun moves through the sky each day, a statically pointed camera couldn't fully convince you that the sun remains above the horizon on its daily course. Fortunately, I happen to have a background in building solar tracking mechanisms (Glory TPS), but lack the congressionally approved NASA budget that is usually required for such a task. After a bit of brainstorming, I came up with an interesting possibility that I thought just might do the trick. A 10 minute trip to Home Depot and $6 poorer, I had my very own solar tracking system (aka, an el-cheepo mechanical lamp timer!) to which I mounted my newly acquiredGoPro Hero2 camera. A quick test one afternoon at home convinced me that I was on the right track, and then I was off on my expedition to Antarctica.

Shortly after my arrival in Antarctica, I explored the rooftop of the Crary science building and temporarily erected a mast and boom structure from which I hung my solar tracking camera with power provided by a 120VAC extension cord. Among the oddities of the southern hemisphere is the relative motion of the sun in the sky. The next time you watch the sun arc its way toward sunset, note which direction it is moving and try to imagine how odd the day would feel if it made its traverse in the opposite direction as it does in the austral hemisphere. This direction reversal caused quite a bit of head scratching and ultimately forced me to hang the rig upside down with the undesirable, yet inevitable introduction of the structure into the camera's field of view each day.

The finicky weather never cooperated for a full day's worth of sunshine, but on my third attempt, I managed to capture over two straight days of solar tracking with relatively nice cloud conditions which I spliced into a time lapse movie.

With a sun that never sleeps, the natural question I get asked all the time is if I am able to sleep? Well, it's amazing what hard work and some room darkening shades can do, because I have had absolutely no difficulty achieving restful sleep each night during my few short weeks in this upside down land!
-PB-

# Cape Bird

**Tue Jan 31, 2012 | 12:34 PM |**

There has been a distinct change in the air around McMurdo the past few weeks. While the cracks in my dry skin have been racing those in the sea ice of McMurdo Sound, the arrival of the Russian ice breaker,*Vladimir Ignatyuk*,advanced the break up of the sea ice in a way that I hope won't be replicated on my hands. However, the melt of the sea ice clearly lags the air temperatures as the once balmy days are beginning to be replaced with significantly cooler and windier days. After several days of cracking through the McMurdo Sound sea ice, the *Ignatyuk* cleared a path into the tiny bay near between our dorms and Scott's Hut and the fuel tanker lumbered into port to resupply the 7 million gallons of fuel that are staged around McMurdo. The sight of water in the sound and the arrival of ships signaled that the Antarctic summer season was rapidly approaching its conclusion.

Meanwhile, our own scientific campaign was on its own home stretch. Having successfully completed 2 of the 4 ozone station installations in the previous weeks, we were poised to finish the remaining installations in rapid fire succession beginning Saturday, January 28th, but poor visibility across Ross Island delayed our progress for two days. Then, on Monday, January 30th, we boarded a helicopter under beautiful, blue skies bound for Cape Bird on the north end of Ross Island. The flight path followed the island coastline with a direct overflight of Castle Rock that I hiked the prior day, then skirted the glacial flanks of the southernmost active volcano in the world, Mount Erebus, and finally hugged the rocky sea cliffs just before touching down on a black sand beach. As spectacular as the icy, mountain landscapes were during the journey, the real treat was our first glance of open water in more than a month. In an primal land comprised exclusively of ice, rock, and sky, the introduction of open water as a new

element was truly refreshing.

The departure from the helicopter onto the beach was filled with the usual hurried movements as gear was quickly loaded into a safe pile away from the landing zone, but then in a surprising sight that surely would not have happened in our previous remote field sites, 3 individuals approached the helicopter bearing gear of their own.

In an instant, reality and dreamspace collided in my mind as I was confronted with an amazingly distinct déjà vu. The spin of the rotor blades slowed as did the motion of these new individuals who had clearly rehearsed their exact motions to coincide with those I had encountered in another time but in this exact place. As quickly as the feeling blanketed my mind and emotions, the rotors and all motion accelerated to their previous pace and the bustling on the beach resumed.

With all of the gear properly accounted for, the copter rose from its temporary roost with a resultant sandstorm in its immediate vicinity. As the scene quieted and the dust settled, introductions occurred and the three beach people turned out to be Kiwis based at New Zealand's tiny Cape Bird Hut just up the hill. As a further confirmation of my déjà vu, I realized I had already met one of the researchers, Kevin, on my first hike up Observation Hill shortly after my arrival in McMurdo and we proceeded to explain the purpose of our visit to the Cape.

The helicopter landing zone at Cape Bird is situated on a flat beach behind which rocky cliffs quickly rise towards an eventual meeting with the glacial arms of Mount Bird. A few hundred yards down the beach, a carefully crafted set of 60 stairs wind their way up the steep hillside to a bench where the Kiwi hut resides. Further up the hill another couple hundred of yards, a trail leads to the automatic weather station and the location of our ozone instrument installation. With 1400 pounds of lead batteries, solar panels, and metal framing, this was clearly going to be a challenging, physical day of work unlike our previous installs, but much to our delight, the Kiwis provided us with a wheelbarrow on the beach and another near the hut to aid in our laborious gear transport. And so we set about two hours of huffing our equipment up the steep flanks to the weather station just to reach the stage that we could actually begin to erect the station. In an ordinary place and situation, the work would have been mind numbing and regrettable, but this place was not ordinary, it was Cape Bird.

As an American, you might think this cape was named for our renowned Antarctic explorer, Admiral Richard Byrd, who among other aviation exploits was the first to fly over the South Pole. Instead, this northern tip of Ross Island was named a century before Byrd on an 1841 British expedition for Lieutenant Edward J. Bird of the ship Erebus. But if you were to step foot on this coast for your first time with no prior

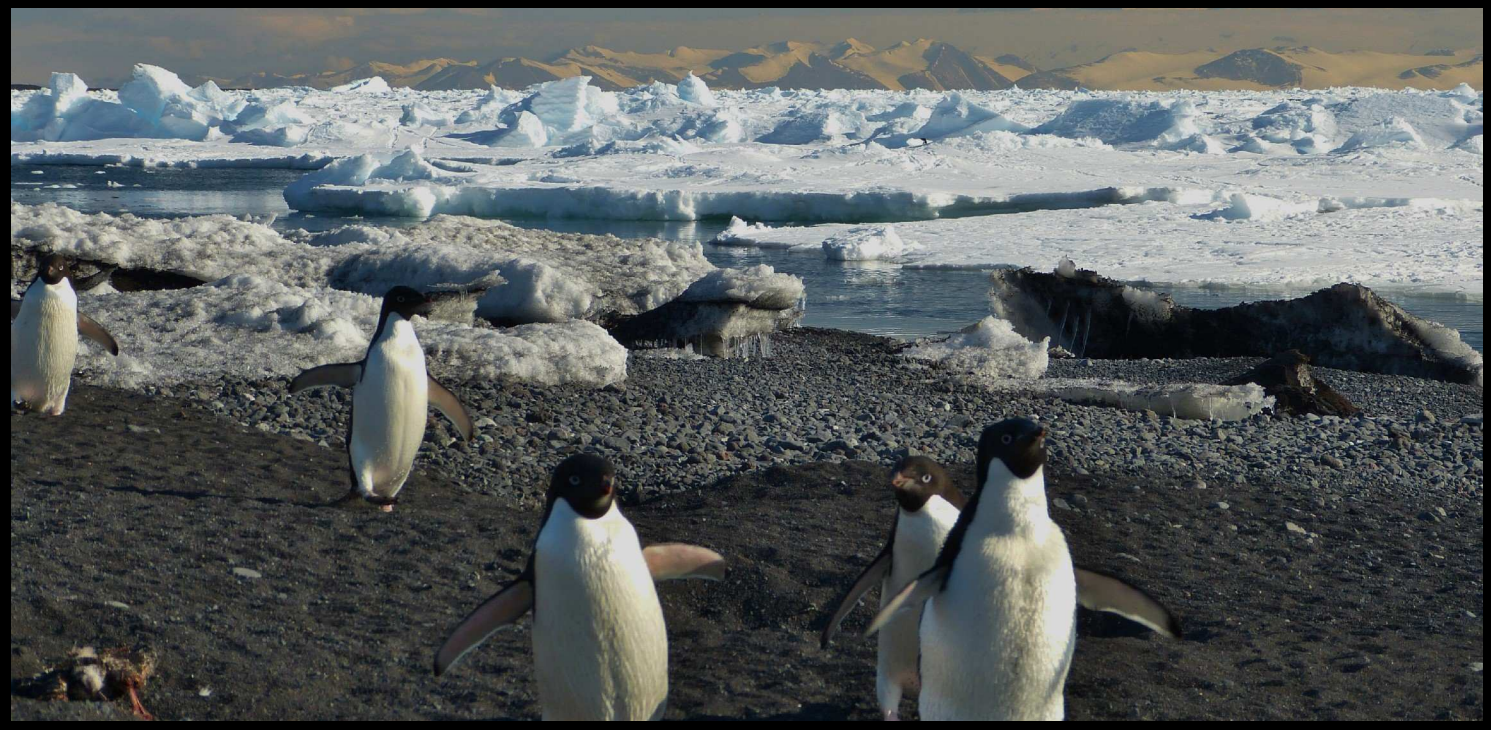
knowledge of its existence, you would likely choose the same name but for a completely unrelated reason. In fact, as our helicopter descended past the cliffs towards the beach, my vision began to fill with dozens of curious little animals who are neither fish nor mammals as you might guess, but are actually flightless birds. With over 100,000 Adélie penguins occupying a rookery along the Cape Bird beach, no matter the name's origin, it certainly seems to have been chosen correctly.

So you can begin to imagine why hauling hundreds of pounds of equipment up the hill was anything but a pyramid- building, slaving experience. For when we crested the hill at the weather station site, our vision was filled by the entire penguin colony, our ears were filled with their incessant squawking, and our noses were filled with the unavoidable byproducts of so many animals of the sea living in such close proximity. The setting was spectacular, but I was concerned that it was a fleeting moment that would vanish the instant we had time to spare, so I directed my full attention towards the landscape beyond our immediate work hoping to absorb as much as possible throughout the day. There are strict guidelines concerning animal interaction in Antarctica, so I quietly observed the penguins from a distance and captured photos from our high perch using my long zoom camera.

When our grunt work was nearing its conclusion, Kevin arrived at our site with a 70 pound battery in arms and an invitation to lunch and tea in the Kiwi hut, both of which we gratefully accepted. We learned about their penguin research over sandwiches, and then Kevin offered a most spectacular invitation to join him on a private, up-close tour of the penguin rookery after we finished our installation. Considering the distance that must usually be maintained from wildlife according to the Antarctic Treaty, his offer was a most incredible opportunity to experience this quintessential Antarctica. With this new goal in mind, the ozone station practically assembled itself over the next few hours, and before long, we found ourselves being guided along the beach in the midst of the massive Adélie penguin rookery.

In sharp contrast to the windy, cooler weather that we had been experiencing in McMurdo as of late, Cape Bird was graced with sunshine, blue skies, and almost no wind. The quiet air allowed ice flows to return close to shore and penguins took advantage of the newfound islands with plunges into the water followed shortly after with amazing leaps out of the sea and landings onto their feet on the ice. At least as amazing and in a behavior I never knew existed, the penguins swam through the water like porpoises with their bodies alternately diving and attaining momentary flight. As we worked our way along the beach, I found myself lagging farther and farther behind the others. The scene around me was all encompassing with mini dramas being enacted by groups of penguins everywhere I looked. But mostly, I was simply enamored by the antics of these bipedal, adorable little creatures who walked as if they were a very distant evolutionary relative of our human species and almost

wholly unrelated to the bird family to which they actually belong. I wandered for some time along the water amongst this alien world occupied by a colony of odd, little inhabitants and an occasional, massive seal who blissfully rested without a trace of motion on the warm, black sand. As I neared the glacial terminus, the other party members had already turned around and begun their return to the hut. I rejoined them for a stroll through the middle of the colony, but quickly found myself lagging again as the dynamics of the local species fully occupied my attention. Eventually, we reached the edge of the rookery and ascended to the hut where the others sipped tea and engaged in conversation. Meanwhile, I was still focused on the occupants below us at the water's edge and with a few minutes left before the helicopter's arrival, I politely dismissed myself for some final time on the beach with the Adélies. The helicopter arrived 25 minutes late which afforded a little more precious time in this special place, and I cherished every bit of it. I knew that my Antarctic experience was going to be special, but my time spent at Cape Bird left me feeling truly blessed. Without a doubt, my time among the Adélie penguins was of the most incredible experiences of my life.
-PB-



# Stranded

**Sun Feb 5, 2012 | 01:58 AM |**

The Ross Ice Shelf is the largest ice shelf not only in Antarctica, but the whole world. In contrast to sea ice that is formed when sea water freezes on the surface of the ocean, ice shelves are created when glaciers flow from their land-borne origins to the sea. Upon reaching the sea, they maintain their ties to the land but begin to float on the sea water. Almost the entirety of the Ross Sea coastline in Antarctica is fringed by ice shelf and the resultant area of the 100 to 1000 meter thick ice shelf is equal to that of France. The very fact that an ice shelf rests on the sea surface means that it is completely devoid of any vertical features. Like so much of the interior Antarctic Plateau, the Ross Ice Shelf is simply white, flat snow as far as the eye can see.

The first three ozone station installations took place in spectacular, mountainous settings representative of the Antarctica that nature documentaries love to share with the world. But in reality, most of the continent is stark white and featureless. So while it was a joy to explore the regions along the Ross Sea of Marble Point, Minna Bluff, and Cape Bird, there was a looming sense that we had not yet glimpsed the real Antarctica. But on Thursday, February 2, we departed McMurdo via a Bell 212 helicopter bound for our fourth and final installation on the blank, white Ross Ice Shelf at a location called Lorne where a University of Wisconsin automatic weather station (AWS) resides.

The helicopter left our familiar McMurdo residence and headed south, quickly passing our previous bounds of exploration of Happy Camper School and the Windless Bight installation. The helo pilot pointed through the windshield and announced over the intercom that we were paralleling a linear track in the snow below known as the South Pole Traverse route. The United States Antarctic Program (USAP) has maintained a permanent base at the South Pole since 1956 and as you can imagine, such a remote and extreme location requires prodigious resources to operate throughout the year. In addition to aircraft support, South Pole Station receives a significant annual resupply via ground vehicles that determinedly trudge their way from McMurdo across the vast continent to the point where all lines of longitude intersect. We followed this impressive track into the white unknown at 130 miles per hour and, after 25 minutes, deviated towards the AWS site.

In the final minutes prior to touchdown, the helo pilot cautioned us of the local weather conditions, saying it appeared that a front was approaching and that visibility could possibly be reduced so low that helicopters could not fly. Compared to close-support trips where the helicopter stays with the scientists in the field, our trips consisted of drop offs from the helicopters followed by 6 hours of ground work and finally, pick up from the helicopters. And whereas most flights are conducted to established field camps meant to support weeks or months of inhabitance, our Lorne location was completely isolated on the Ross Ice Shelf with not a hint of life for 50 miles in any direction. This very aspect of the campaign was described by Lars to me back in July of 2011, and I found it highly compelling that the work not only had a clear scientific purpose, but an adventurous risk to it. And so it was without surprise that we heeded the pilot’s advice carefully as we parted ways with the chopper.

Our skills were well honed from multiple assembly/disassembly cycles of the ozone stations, so we proceeded rapidly with the installation in hopes of accomplishing at least part of the work before the weather could take a turn for the worst. In the midst of our busied efforts, I was taken aback by the vast expanse of white in which we stood. Pausing for a moment, I took out my camera and snapped a photo of our two survival bags against a backdrop of endless ice shelf in a foreshadowing of the events to come.

Even as our work progressed, we were mindful to keep tabs on the sight of White Island far in the distance as an indicator of the relative visibility. After a few hours, Lars dutifully radioed the helicopter dispatch to notify them of our deteriorating conditions with reduced visibility to White Island, but they replied that since all the helicopters were engaged in other activities, there was no immediate opportunity for pick up and we resumed our efforts. Not long after, the radio buzzed to life and announced to all stations that the ice shelf air fields had been declared Condition 2.

McMurdo operations employ a method of describing weather conditions as a means of evaluating the ability

to safely perform work outside. Our entire time spent on the continent had consisted of Condition 3 which is the most benign category, whereas Condition 2 indicates high winds (48-55 knots), cold temperatures (-75F to -100F windchill), or low visibility (<1/4 mile), and Condition 1 represents the most deplorable possible state of existence. Even in our present environment, the Condition 2 announcement was able to send a chill down my spine.

For the first time since our arrival in Antarctica, we were truly vulnerable. Providing solid leadership in response to the fact that we would not be retrieved by helicopter on schedule, Lars declared, “It may be an extra 2 hours or 2 days we are stuck here, so we need to prepare for the worse.” His advice was honest and to the point; from that point forward, we had to be particularly conscientious of our every action if we were to brave the elements on our own.

In almost no time, the installation was complete while our weather had remained pleasant with slight winds, sunny skies, and good local visibility. Fifty miles away was a different story. Visibility in McMurdo remained poor as were our immediate prospects of return to town. At regular intervals, Lars contacted helo ops using our VHF radio that employed a repeater on Mount Terror to relay the radio signal back to McMurdo. During one of these communications, helo ops and then MacOps each declared that our transmissions were broken and unclear. Switching to the back up radio, he tried radioing again, but to no avail perhaps due to issues with the repeater station. Without radio communication, our prospects were looking much grimmer. Fortunately, we also had an Iridium satellite phone which he used to call back to base. As I stood nervously eavesdropping on his conversation, the situation took yet another turn for the worse. As he described the communication schedule we would follow, the phone’s battery died, and our lifeline was left without knowledge of our path forward. Redundancy is a wonderful thing and as proper planning would have it, there was a spare Iridium battery that was quickly swapped to regain communication with base. A communication schedule was quickly established with McMurdo, the phone was powered off in an effort to conserve battery life, and we were left to fend for ourselves for the short term.

An incessant wind blows unimpeded across the Ross Ice Shelf from the south that quickly robs heat from anything in its path while providing a beautiful dance of blowing snow across the ground. In its opposition that afternoon, a bright sun warmed our faces when we turned our backs to the wind. And so following instructions from Happy Camper School a month earlier,

we set our shovels into motion and into the Styrofoam-like snow to build a couch set down below the surface. The snow we removed was stacked carefully on the windward side of the sofa to form a wall that reduced the effect of the 20mph wind to nothing. We settled proudly onto our newly built furniture, soaked in the rays, munched on deli sandwiches, and Sam even launched a colorful kite into the sky. Our departure was delayed, but we were extremely comfortable in our little outdoor living room and in great spirits to wait a few hours for the copter’s arrival. The hours passed and our restless, creative personalities set us each on tasks that invariably involved digging in the snow and fortifying our little shelter.

As our shovels chopped and dug at the snow, we received an unexpected visitor in the sky. Rather than the helicopter that we hoped would descend upon us, the most prevalent Antarctic bird of flight, the skua, had somehow navigated dozens of featureless miles across the ice shelf to our precise location. Perhaps it was drawn by the kite in the sky or by the smell of our snacks, but in any case, it was comforting to see another sign of life in our desolate, isolated situation. The journals of great Antarctic explorers reported great excitement upon sight of such an animal when in dire conditions, and after this little guardian angel graced our presence, I felt a deeper appreciation for the thoughts and emotions that these men must have experienced.

Time passed slowly until the hour of truth finally arrived. At 8pm, Lars made the call back to helo ops to assess our possibility of being retrieved. Although we had discussed and strongly considered the possibility throughout the day, it was not until that phone call that we realized our actual predicament. Conditions had not improved, no helicopters would be flying to pick us up, and we were going to be force to spend the night. In short, we were stranded.

It is one thing to be stranded in the States where AAA or a police officer is a cell phone call away, where weather is generally favorable, and where we are comfortable in our backyard. But to be stranded on the Ross Ice Shelf in Antarctica is something altogether different. To be left so isolated and so vulnerable in such a harsh environment, one could easily be reduced to tears and quickly succumb to the conditions. Fortunately, the United States Antarctic Program (USAP) recognizes these very real risks and goes to great lengths to minimize their impacts when they inevitably happen. For one thing, we were well equipped in our extreme cold weather (ECW)

equipment that every participant must wear on aircraft flights. Second, we were well trained to handle such a situation during our mandatory Happy Camper School. And finally, we had our requisite survival bags that are dropped with all team members on helicopter flights.

So after concluding the satellite phone conversation, we embarked on the uncommon act of opening and using our survival bags that contain tents, sleeping bags, stoves, cookware, emergency food rations, and various assorted items. Since we had already spent our previous waiting hours in the construction of a snow cave and snow wall, our shelter was nearly complete apart from the tent that I decided to sleep in. With our shelter accounted for and our bellies empty, the next order of business was filling them with warm fluids and replenishing calories. Minutes later, the Whisperlite stove roared to life, snow was melting into water, and we were well on our way to providing for all of our basic needs. Although the survival bags are certainly sufficient to bivouac for the short term, they are aptly named and the culinary experience is of the utmost simplicity. Daily rations consist of a freeze dried backpacker dinner, three survival hard tack bars, and a chocolate bar per person per day. Among the assorted dinners was a crowd unfavorite from Happy Camper School, Black Bart's Chili. While the packaging of the chili had been comically rebranded to express its expected flatulent quality, Sam and I suspected that the Happy Camper prejudices against this meal might be unwarranted and decided to give it a try. Whether it was the survival scenario or just the right balance of spices we may never know, but both of us were shockingly pleased with good ole' Black Bart's Chili.

By the time we finished dinner and melted enough snow to maintain our hydration, the clock had advanced to almost midnight and the sun had progressed across the sky to a perfect position among the clouds that amazed us all. A sun dog arced around the sun in a partial circle from the ground up to the blue sky while a beam of light projected directly down to the snow below. It was a little blessing to be stranded in such a forsaken place and witness an event that even left my two atmospheric scientist friends in awe.

The long day's work in the snow had taken its toll, and I gladly collapsed into my down sleeping bag for a full night's sleep that was uninterrupted until my watch alarmed at 7am in preparation of the next scheduled call back to helo ops. Any hopes of retrieval were quickly dashed when I poked my head out of the tent into near white out conditions. Nonetheless, Lars made the satellite phone call and learned that conditions in McMurdo had improved markedly in spite of our locally deteriorating conditions. While the news was somewhat

frustrating, the next call was agreed to occur at noon and we retreated to our shelters for additional rest. As the morning progressed, conditions improved enough to allow us to leave our shelters, and we were finally able to melt more snow. Meanwhile, Sam bravely tore open the aluminum packaging of the Coast Guard approved emergency food rations and discovered that the thick, blocky rations were actually quite palatable with a taste that reminded me of a lemony, Crisco-y, shortbread cookie. The quick brunch was followed by more napping in our shelters and reading books that were thoughtfully included in the survival bags.

Noon check-in time came and our local visibility was still poor, but the call was made and the next check-in arranged for 5pm. We had been at the Lorne site for 26 hours and it was becoming apparent that it might be several days before a helicopter could reach us. Furthermore, there was the possibility that the weather could remain poor and a helicopter could not reach us for much longer. While we were comfortable in our present shelters, it was becoming obvious that the survival bags were meant for the short duration with food and fuel for only 3 or 4 days. Once more, we retreated to our shelters and passed the afternoon like Weddel seals. Following the example of the seals, they in their thick coat of blubber, us in our tubes of down, we emulated their minimal motion on the ice as the best way for mammals to survive in the harsh conditions.

5pm arrived but improved visibility did not. The call was made and an arrangement was struck. If we noticed improved conditions before the helicopter night shift ended at 11pm, we would call helo ops and they would see if they could send a copter. On the other hand, if a pilot decided that conditions were favorable, we would simply hear an approaching helicopter and would quickly break camp to our welcome retreat. If neither of these conditions were met, we would call the following morning at 7:30am to tag up.

We resumed resting like seals for a few hours followed by our second warm, dehydrated dinner at Lorne. This time, I fondly revisited my old friend Leonardo da Fettuccini while we each studied the horizon to the north. Our local visibility was good, but the long view to White Island was still unimpressive. Still, we maintained our patience and optimistic outlooks. In order to provide a helicopter sufficient time to reach us, we needed to alert helo ops by 9pm if a window of opportunity was present. As the time approached, we could barely make out the flanks of White Island, but the visibility waivered and we decided to wait until the

morning for better weather.

We were preparing ourselves for a second night bivouacking on the ice and the reality was that we could only continue on our present course for two more days. We discussed the possible options if a helicopter could not reach us in that time. Walking 50 miles across a crevasse ridden ice shelf was clearly out of the question, so we were completely dependent on rescue from McMurdo. Perhaps a twin otter airplane could land in more difficult conditions than a helicopter or at least drop food and fuel. If not, our close proximity to the South Pole Traverse route provided a reasonable location for a ground rescue by a search-and-rescue tracked Hagglund equipped with ground penetrating radar for avoiding crevasses. Regardless of the method, we all agreed that this topic need to be broached during our satellite phone call the next morning.

With these heavy realities in our minds, time and the sun advanced to the location in the sky where the previous night's sun dog had occurred. On the second night in a row amid the blowing ground snow, the ice shelf and the sun treated us to an atmospheric delight but this occasion presented two concentric sun dogs nearly circling the sun. While our situation was serious, the beautiful phenomenon in the sky provided great encouragement before we headed back to our shelters for our second night on the ice.

The stark Antarctic environment is rich in some qualities and almost completely devoid of all others. Sight is filled with blinding white, while colors are limited to the blue of the sky and browns of the barren rocks. Smells are almost completely nonexistent. Sounds belong solely to the wind and that which it blows. In our camp, the wind flapped my tent and caused the rattling of the rime ice cups on the ozone station. And every 15 minutes, the ozone instrument sprung to life with a predictable buzzing tone of its pump. These sounds and no others had filled my ears as I rested in my tent the entire day, but as I was drifting off to sleep at 10:47pm, a new hum entered my brain. With little else to occupy my thoughts, I locked onto this faintest of sounds and imagined the best. My heart began to race faster and the sound seemed to increase in amplitude prompting me to pop my head out of the tent. A minute of careful listening later, and there was no doubt in my mind. Excitedly, I shouted to my compatriots in the cave below, "A copter is coming! A copter is coming!" In short order, Lars had raised them on the radio and confirmed that they were on their way to get us. And finally, the beautiful, red shape began to materialize in the sky. We raced at a frantic pace piling gear into bags hoping to beat a quick retreat, but the copter set down and powered off the engine to allow us ample time. We gratefully greeted our saviors who were as interested in hearing about our story as we were in seeing them. Not much later and with great relief, the helicopter floated up and above our icy home of two days and we were on our way home.

The half hour flight was filled with quiet gratitude. On the one hand, we unwittingly had a genuine Antarctic experience that provided the smallest taste of what the legendary Antarctic explorers encountered in their bold explorations of the continent. But unlike those heroes, we did not extricate ourselves from our predicament; we were in complete dependence on the dedicated contributions of the entire intricate, logistical system that USAP operates in McMurdo. So while it was satisfying to competently weather our short storm on the Ross Ice Shelf, it became overwhelmingly apparent how much gratitude I owed the USAP team members who kept us safe. With much humility, *Thank You*.
-PB-

# Onward

**Thu Feb 9, 2012 | 02:47 AM |**

For the first time during my 6 week stay in McMurdo, the phone in our dorm room rang to life. Awaking from a deep, restive sleep after our Ross Ice Shelf adventure, I noted that the time on the digital clock read 9:00am. In my groggy state, I overheard a conversation with none other than Natalie from helo ops. A minute later, we learned that we had been scheduled for a 9:15am flight to Marble Point, but we were certainly too late. Instead, we postponed the quick trip to 2:30pm and set about our work.

Five minutes before the scheduled departure time, Lars and I found ourselves strapped into an A-Star helicopter and rising above McMurdo. Compared to the larger, utilitarian Bell 212s, the A-Star felt like a sports car with comfortable seating and remarkable panoramic views of the landscape sweeping by below us. Although we had completed the four installations already, data from the Marble Point site was out of sorts and a mission was scheduled to quickly retrieve the instrument so Lars could troubleshoot it back in the warmth of the Crary Lab. With only 2 days remaining in my Antarctic stay, this quick jaunt would be my final time in the air over the Ross Island region, and the large windows provided an ideal vantage point to soak in the landscape. In the time since our first installation at Marble Point, the Ross Sea ice had retreated significantly and our flight path was compensated to keep us safely over ice in case of an emergency touch down. Although now familiar, the sights of Mount Erebus, Ross Island, Dry Valleys, and Transantarctic mountains were as appealing as the first time I laid eyes on them. The landing next to the ozone station was without incident and as we retrieved the instrument from the Hardigg case, the pilot hopped 2 miles up the coast to drop some food and top off fuel at the small Marble Point field camp. Our work was completed in short order and when the chopper returned, I was offered the front seat next to the pilot which I gladly accepted. The return flight to McMurdo provided stupendous views and I savored each moment of my last helicopter flight over Antarctica. Within 2 hours of leaving, we were back in the lab with the instrument disassembled and diagnosed with a faulty pump that would easily be replaced before its eventual return to the wild by Sam and Lars.

Even though we had finished the deployments of the primary ozone stations and our


time on the ice was quickly dwindling, the test unit was still living in the lab after its retrieval from Windless Bight. So with my departure quickly approaching the following day, we loaded into a Pisten Bully for a third and final trip to Windless Bight. The tracked vehicle moved slowly through town and onto the flagged ice route that we had traversed twice before, but after 1.5 hours, we reached our previous farthest point and faced fresh powder in the direction of the AWS where the ozone station would reside. Sitting behind the wheel of this snow machine, I pointed at a spec in the distance, held the throttle open, and floated 2 miles over the fluffy snow which churned out clouds of white behind us. Unlike the primary ozone stations, the test unit used a much smaller, preconfigured power system and only needed to fastened to the north side of the existing AWS tower. Half an hour later, the work was completed and we slowly, uneventfully wound our way back to McMurdo.

Much as during my first days in McMurdo, the last ones were filled with little down time. So after dropping my bags off to be palletized for the next day's flight, it was time to celebrate. A group of old and new friends gathered for wine at the Coffee House after which an impromptu party ensued in our dorm's lounge. It was a fine way to spend my last night in Antarctica, but with knowledge of a full day ahead, the party had to an end and I turned in for my last night in the dreaded top bunk.

My to-do list was rapidly reaching completion as the hour of my departure drew near, but there was one final challenge I had yet to attempt. Throughout my time in McMurdo, I made a concerted effort to maintain my gym and running schedules and along the way came to really enjoy the two arduous loops around Hut Point and Ob Hill. At some point, I decided that if each loop was good on its own, combining them into a great figure "8" would be the best way to tour the town and get a great work out. With plenty of warm gear to combat the cold winds of the exposed ridgelines, I set out on my run with an ascent of Hut Point Ridge first. Upon reaching the historic cross at the point, another fellow and I spotted two Menke whales spouting in the water near the ice. Once again, I had been graced with a beautiful display of nature and knew that my experience was very near complete. Despite being twice my previous running distance, the loop progressed wonderfully and I savored the McMurdo views for the last time.

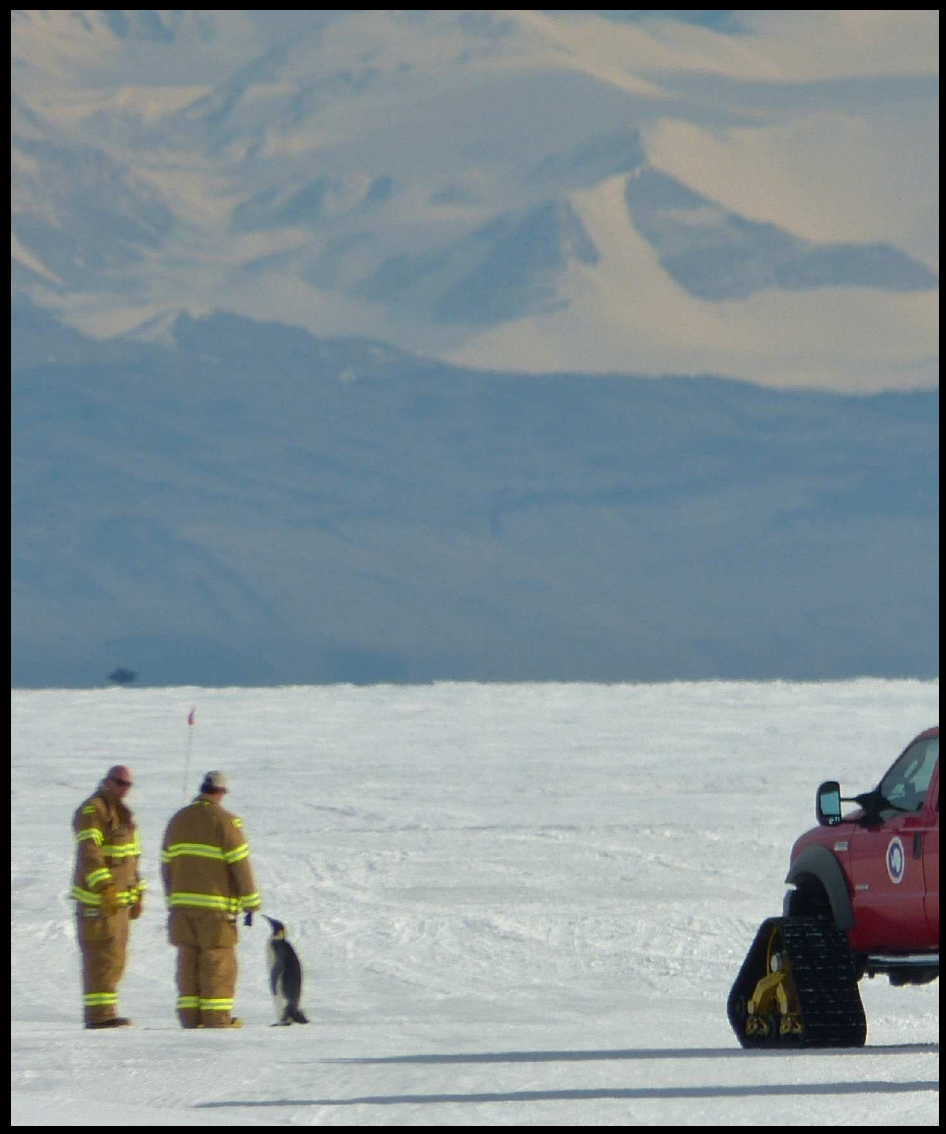
Having thoroughly enjoyed monster truck races in my youth, one of my favorite scenes in *Encounters at the End of the World* involved the largest bus in the world, *Ivan the Terra Bus*. Sitting on massive balloon tires that allow it to traverse the sea ice, the bus is a complete monstrosity that happily exists among the varied vehicular oddities of Antarctica. When I arrived in Antarctica, I was disappointed to learn that I would not ride on *Ivan*, but for my departure, I was treated with a ride on the huge bus out to the Pegasus runway.

Shortly after arriving at the haphazard airfield, the sea of Big Red jackets focused their sights on a drama that was playing itself out a few hundred yards away near the runway. Dressed in bright yellow gear, two firefighters stood toe-to-toe with a nemesis they had never been trained to face. Standing half their height, but with great pride as the king of the Antarctic continent, an Emperor penguin begrudgingly moved off the airstrip in response to their repeated shooing motions. And then with the comedy of a silent film, the penguin would turn about, face the fire fighters like Joe Piscapo and refuse to move another step. Although the distance between the peanut gallery and the comedic act was large, we were all certain that the penguin was shaking his head in defiance and saying, “Are *you* talkin’ to *me*?”

This final scene of Antarctica filled my head along with the countless others of the previous 6 weeks as I boarded the voluminous C-17 military transport jet. My time on the continent was filled with adventure, beauty, wonder, learning, and of course, work. Under the guidance and leadership of Lars, we had successfully completed our campaign to install the network of ground ozone stations, so with a sense of accomplishment, I proudly left the white continent of Antarctica.

Although the C-17 was quieter and faster than the LC-130 that we took from Christchurch to McMurdo, the 5 hour return flight was still noisy and rough. After touch down on the tarmac, we all experienced something for the first time in months-- darkness. Looking high in the sky over our aircraft, the full moon graced the sky and it was clear that we had been transported to a new place.

After coordinating with several McMurdo acquaintances, I joined forces with two friends I met during my first week in town. Alia, James, and I piled our gear and ourselves into my little Nissan rental car and headed north to the coastal town of Kaikoura for a few days of R&R before they continued their journeys back to the states. Following dinner in town, we made our way to the rocky beach to enjoy a few beers in the welcome darkness. One Speights flowed into another as we shared our respective takes on Antarctic life, and the cathartic experience felt truly complete when we realized that we had been standing in a gentle rain for over an hour. Antarctica had been washed into the past, and a New Zealand adventure awaited me.
**-PB-**



# New Zealand

*The grass is always greener on the other side*. No where does this expression hold more truth than Antarctica where grass has not existed for eons. Not surprisingly, visitors to the white continent spend much time daydreaming of their return to a place where the grass is greener both literally and metaphorically. And since Christchurch, New Zealand is the port of call for Antarctic redeployers, it's only fitting that many dreams take shape in the land of the Kiwis.

Vegetation, warmth, and water all occupied my post-McMurdo fantasies, so after I returned from the Ice, I promptly began my journey to explore the idyllic coast and beaches of New Zealand's south island. My plan was to tour the south island of New Zealand for 4 weeks in a counter-clockwise direction with a focus on the warm coastline in the northern part of the island followed by exploration of the world renowned, rugged mountains in the southern part of the island. Half way through the trip, my Colorado kayaking buddy, Robert Baca, would join me on the west coast with hopes of some Kiwi kayaking followed by hiking and plenty of adventure. Apart from meeting Robert on February 18th and flying out of Christchurch on March 5, my itinerary was completely open and I was all ears to suggestions from others who had already enjoyed this wonderful island.

I began my journey on February 7th by heading to the small coastal town of Kaikoura a few hours north of Christchurch and was fortunate to enlist the company of two Antarctic friends for a few days of company and readjustment to life in the real world. Our days were blissfully lazy, but we still managed to explore the rocky shores via surfboard and hike through the forested hillside before they headed back to the States.

After their departure, I found myself on my own for the first time in months as I continued to follow the road north. The romantic notion of independent travel is always balanced in reality with intermittent feelings of loneliness, but fortunately for me, a quick stop on the coastal drive led to a dozen New Zealand fur seals that captured my attention fully and marked the beginning of my solo travels.

## Queen Charlottle Track

I continued north along the coast to the Marlborough region known for its warm, sunny weather, vineyards, and maze of waterways. While perusing the *Lonely Planet* guidebook in McMurdo, I came upon a description of a coastal hiking trail in the Marlborough Sounds that offered the best of wilderness and civility. The Queen Charlotte Track meanders along steep, vegetated hillsides for several days of enjoyable hiking. But rather than carrying food and camping gear for the entire duration, the trail takes advantage of numerous, isolated hotels that are only accessible by boat or trail. Among the hotels, the Furneaux Lodge particularly piqued my interest with descriptions of its soft grass lawns that lead to the water and its mouth-watering restaurant and bar.

So on February 10th, I departed the port town of Picton on a water taxi to the start of the Queen Charlotte Track in historic Ship Cove where Captain Cook moored his ships on several occasions in the 1770's. With little need for food or sleeping gear, I set forth from the cove with a light pack on my back and began an immediate ascent of the heavily forested hillside that was dotted by grand old beech trees among New Zealand's national symbol, the prolific fern. After noticing a distinct lack of animal and even insect life, a deafening cacophony filled the air from locusts that were at once everywhere and nowhere. Several hours of hiking later, I came upon an idyllic flat, low location at the sheltered end of Endeavor Inlet which houses Furneaux Lodge. I must admit that the cool, wet weather didn't match my daydream of lounging on the grass by the water, but it did provide an ideal reason to escape to the gorgeous Victorian retreat where I read my book, played the piano, and enjoyed a satisfying meal of mussels, seafood chowder, and Sauvignon Blanc before retiring to my bed in the stone barn known as The Croft. The following day's weather hinted at improving conditions, but the sun never really made its presence known during several more hours of hiking before I boarded the water taxi back to Picton and my next destination.

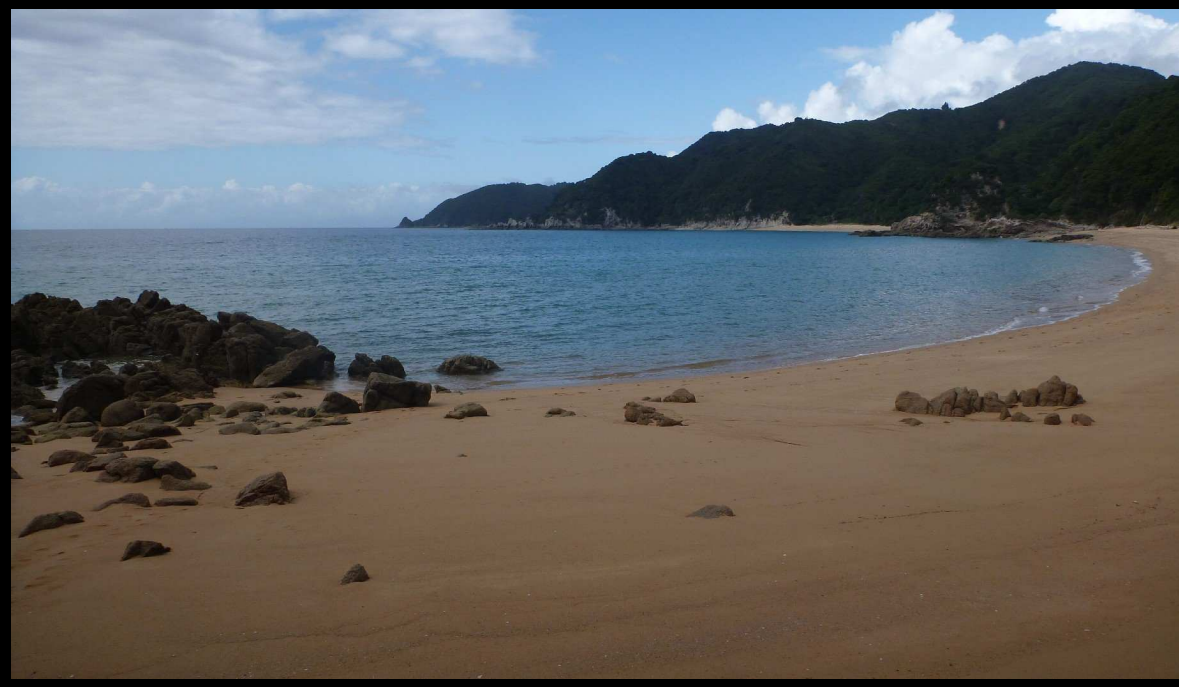
The locals all claimed that rain and overcast weather were completely uncharacteristic for the Marlborough region during summer, but when I told them I was driving to Nelson to the west, they all but guaranteed fair conditions in "Sunny Nelson". Compared to the isolation of Antarctica, the tiny towns of Kaikoura and Picton, and the solitude of the Queen Charlotte Track, Nelson felt like a bustling hub-bub and reminded me a bit of suburban Boulder, Colorado. It only served as a pit stop in my journey, but I took advantage of the blue skies and warm temperatures by fulfilling a long-time dream to soar through the sky in a paraglider. The experience was completely surreal with the ground moving slowly below me as I was suspended beneath the large aerofoil with an expert pilot at the controls. Although I thoroughly enjoyed the experience, it was not the life changing moment that I thought might divert my spare time towards a new hobby.

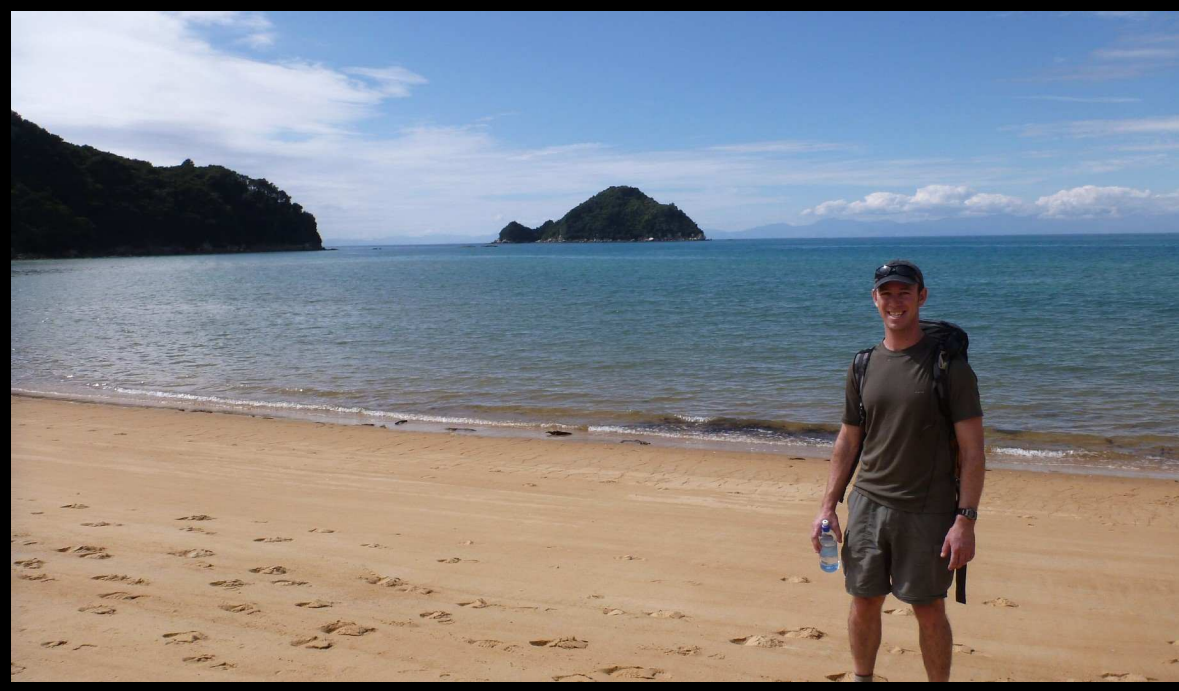
## Abel Tasman

Nowhere on New Zealand's south island is better known for warm, sunny beaches than Abel Tasman. The national park is named for the Dutch commander who first discovered the south island in 1642 and affords incredible opportunities for exploration by foot or sea kayak. Spaced thoughtfully along the coast are a network of Department of Conservation (DOC) huts that eliminate the need to carry a tent or sleeping pad allowing for light travel and enhanced enjoyment of the tropical setting and azure waters. On February 13th, I boarded a water taxi from the small town of Marahau in order to shorten the track length into the timeframe before Robert's arrival. An hour later, I began tramping at low tide in Bark Bay and made haste to reach the Onetahui tidal crossing before it became impassable. In contrast to my previous hike, the weather was beautiful and I was definitely not disappointed in the famous aqua marine waters. As another example of the civility that I enjoyed along New Zealand's tracks, I stopped mid-day at the barely accessible Awaroa Lodge for a beer and allowed myself to relax a bit. However, the stop allowed time for the tide to rise which resulted in having to wade through water for a kilometer to reach Awaroa Hut where I spent the night sheltered from the rain.

I rose early the following morning in order to make the 1 kilometer crossing of Awaroa Inlet at low tide which would be absolutely impossible when high tide adds 10-12 feet of depth to the inlet. With no time commitments and soothing overcast skies in the morning, my mind completely relaxed for the first time in months as I hiked through primitive forest high above the water. Throughout the day's hike, landslides were evident as a result of more than 20 inches of rain on Christmas day. As I moved north, my body protested with an upset stomach that slowed me to a near standstill and ultimately forced my to rest in the sand at Anapai Cove as the sun returned to the sky. Still under the weather, I trudged on towards my next hut, but was forced to rest in the shade of two huge sequoias that stood as sentries on the beach in beautiful Mutton Cove. By 6pm, I reached Whariwharangi Hut, cleaned myself up, quickly fell asleep in the spooky old farmhouse.

My stomach felt remarkably better on my third day, and I headed south retracing my steps in order to reach the water taxi at Totaranui. However, I followed a welcome detour to Separation Point that stands as a high, rocky promontory above the water and is home to seals and cormorants. The sun was out in force for most of the day, and my sweaty t-shirt attested to the fact that I finally found the warmth that I longed for in Antarctica. As I spent the last hours wandering back towards Totaranui, I came upon secluded sand beaches that were out of a dream and took advantage of the incredible setting with a quick dip into the blue waters in tiny cove next to Anapai before my rendezvous with the water taxi.





## Buller River

Having completed my exploration of the northern coastal region, I headed south along a picturesque back road that wound its way along a river and through organic farms before finally arriving at the remote town of Murchison. Generally unknown by tourists, the little hamlet is centrally located among dozens of whitewater rivers and is home to the only company that rents whitewater kayaks on the south island. On February 16, I met up with legendary kayaker Mick Hopkinson at his grassy retreat, the New Zealand Kayak School and promptly began to arrange rental of kayaking equipment. With his assistance, I met three kayakers from Idaho who were in the area and coordinated to join them on a few stretches of the local Buller River. The green waters and mellow rapids of the Class 3 O'Sullivans and Earthquake stretches of the river provided a perfect transition back into a kayak after months away from the sport. But with low flows in the area and nowhere else to rent a boat on the south island, my pleasant day on the Buller turned out to be my only whitewater kayaking experience in New Zealand.

## Punakaiki

The next day I followed the Buller River along its course once again, but this time I was in my little white Nissan rental car and continued until I reached the west coast near Westport. I continued south along a coastal road that *Lonely Planet* declared as one of the planet's 10 best road trips. Suffice it to say, the views were absolutely spectacular and I found myself stopping the car constantly to snap photos. Robert arrived the same day and hopped a bus west across Arthur's Pass, so I proceeded onward to Greymouth for our rendezvous. With a few hours to kill in the coastal town, I made my way to the small surf beach and after a few minutes of small chat found myself surfing the small waves under the warm sunshine on a borrowed surfboard and wetsuit! My surf session soon ended and I found Robert in the nearly abandoned downtown of Greymouth. The spectacular coastline had made quite an impression on me, so we hopped in the car and headed north to revisit the sites under the evening light. The Punakaiki Rocks are limestone that has been worn away to resemble stacks of pancakes among the crashing surf and provide wonderful photographic opportunities at any time of day, but particularly at sunset.

## Fox River Cave

Although I had a few activities in mind for my New Zealand trip, this was one of the few vacations where I was open to random opportunities as they presented themselves. And so when Robert suggested that it might be fun to hike to some caves near Punakaiki, I figured, “Why not?” and wound up having one of the coolest experiences of the entire trip. Fox River Cave is reached by a 4 mile hike along and through the Fox River, followed by a short, but steep ascent of the limestone valley walls. Apart from a few cliff overhangs and a guided tour of Lehman Caves in Great Basin National Park, I had never explored a cave and was in for quite a treat. The official opening matched one’s expectations, but around the corner I found another small entrance and decided to explore it while Robert proceeded down the main passage. A minute later, I reached an impassable constriction but suspected that it would lead to the main tunnel. I shouted to Robert who was able to hear me on the other side of the impasse and eventually had him verify that he could see a few rays of my headlamp beyond the constriction. I stared at the tiny opening and then at my torso and began to contemplate what seemed impossible. A minute later, I shouted to Robert that I was going to attempt to lay my body on its side and squeeze through the claustrophobic aperture. He obviously disapproved, but at least if I got stuck, he would be able to hike out to get help. The squeeze was absolutely ridiculous, but moments later, I was on the other side, muddy but safe! My mind was blown and I felt like I could really get into this whole caving sport. Almost immediately thereafter, we witnessed stalactites clinging to the ceiling and stalagmites standing proudly on the floor of the tunnel. With every twist and turn, the cave revealed new mysteries and beautiful sights that left me fully entranced. Although we had been told that the cave was only 150 meters deep, we somehow managed to spend over 2 hours exploring its reaches including a hidden passage that seemed to rarely see visitors. I was absolutely thrilled about the experience even well after we left the cave and was fortunate that Fox River was just the first of several cave explorations during our New Zealand visit.

## Copland Track

On February 20, we continued south along the coast and made obligatory visits to the touristy Frans Josef and Fox glaciers. The following day began with a steady rain that we hoped would recede in appreciation of the long day we had ahead of ourselves hiking the Copland Track. But as fate would have it, the rain maintained its constant onslaught for the duration of our long day on the trail which resembled a streambed much more than a track through the woods. The landscape of the south island's west coast is home to temperate rain forest, and 8 hours of hiking through the temporary streams and soaked to the bone gave us a true appreciation for the term rain forest.

A little more than half way through the hike, we rounded a corner and were shocked to see where the trail led. The path abruptly ended at the edge of a raging class V creek and didn't resume until 200 feet across the ravine. In between, a shaky, metal foot bridge was suspended above the torrents of Architect Creek. We traveled one at a time across the bridge knowing that a fall would be fatal, but trusting that engineers had properly designed the structure. Having spent countless hours staring at rapids from shore and from my kayak, it was fascinating to examine them from directly above. A few hours later, we came upon a second swing bridge that was lofted 80 feet above Shiels Creek. I was shocked that none of the rangers had even mentioned these litigious bridges and could easily imagine an acrophobic hiker reaching the bridges and immediately turning back rather than continuing on.

It would be a shame to turn around so close to Welcome Flats though, since a wonderful hut and natural hot springs reward the weary traveler who makes it past the perils of the trail. Soaking in the hot springs with a glass of red wine and watching waterfalls on the steep valley walls made the entire hike worth it. And when we hiked back out the following day, I was struck with a weird feeling. I realized that despite the temporary misery of hiking through the rain, I had truly enjoyed the experience and felt that hiking in fair weather was not nearly as satisfying as experiencing the land when it was alive with its full essence.

# Rob Roy Glacier

With blisters on our feet and sore legs, we drove south to the lakeside town of Wanaka hoping to escape the rain, but instead resorted to relaxing for the day and accepting the incessant fall of water from the sky. On February 24th, we left Wanaka and drove along a dirt road complete with water crossings into Aspiring National Park. The road coursed through spectacular fields of sheep set among cliff walls and glaciers in the distance. When the road ended, we shouldered our packs once again and headed up a stunningly beautiful trail for two hours to Rob Roy Glacier where we cracked open Speight's beers and picnicked in the sun directly beneath the glacier.

## Milford Sound

Traveling south from Wanaka, we spent an obligatory day at the adrenaline capital, Queenstown. In the morning, we took an action packed ride on a jet boat through Shotover Canyon. After lazing away the early afternoon on a green lawn in town listening to live acoustic music, we checked out some adventurous souls who plummeted off Kawarau Bridge where bungy jumping was born in 1988, and then it was back in the car moving south to the town of Te Anau.

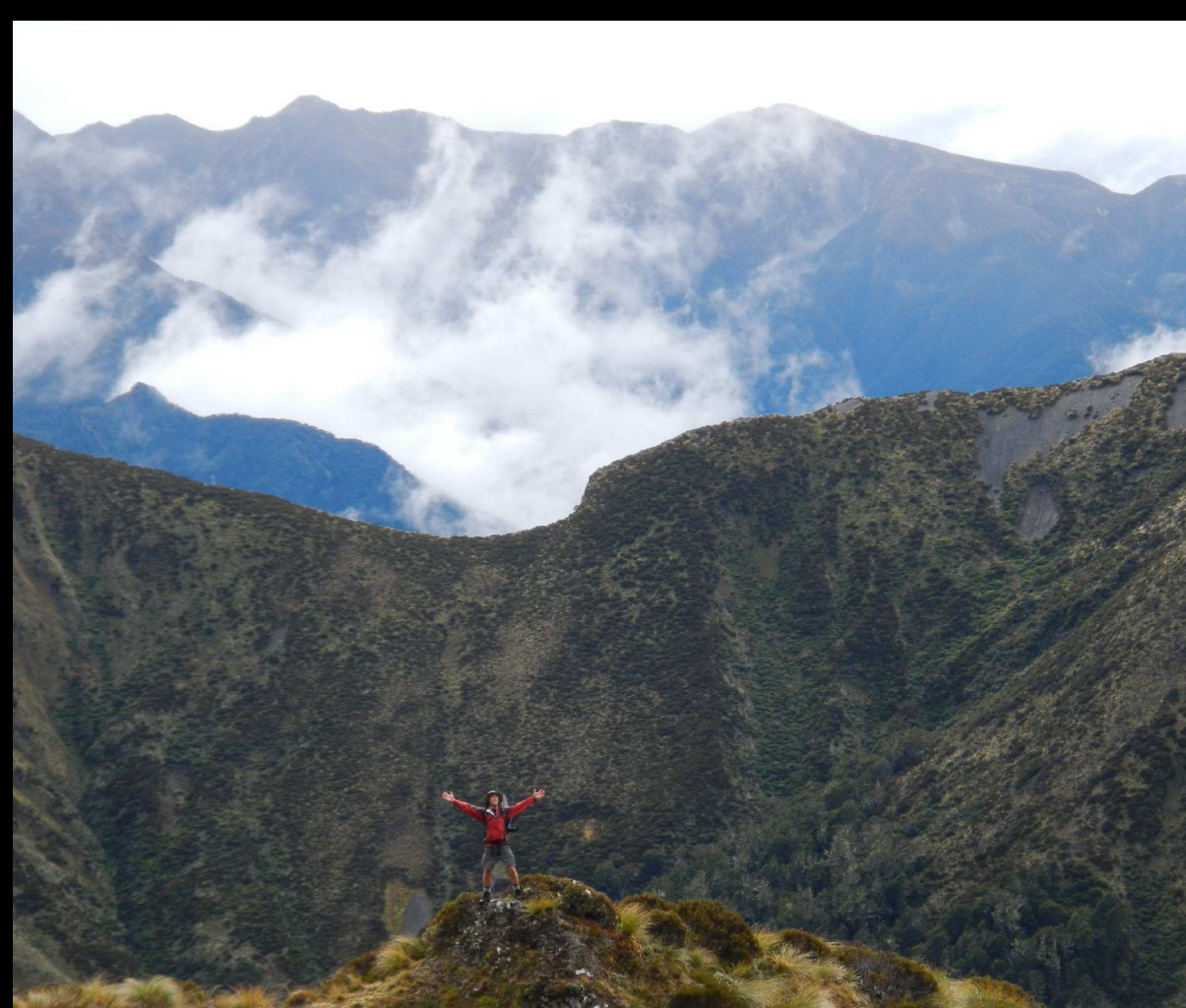
On February 26th, we changed course and drove northwest along a spur road directly into the heart of Fjordlands National Park to one of New Zealand's most famous natural landmarks, Milford Sound. Cloudy skies and rain followed us once again but were to be expected in the third rainiest location on the planet. Fortunately, the rain and clouds lifted when we reached the Sound and those that remained provided a mystical presence to the special place. The next morning, we woke before sunrise and gathered with a small group to explore Milford Sound by sea kayak. The morning was cloudy, but the water was absolutely still with no wind or waves to impede our progress. Half way out of the fjord, we paddled directly under a waterfall that was hundreds of feet high that created powerful winds that could easily flip an inattentive kayaker. Fortunately, we stayed upright and continued our paddle through the fjord towards the sea and were treated with views of fur seals as the sun slowly returned to the sky. By 1pm, we had completely exited the fjord and were picked up by a motor boat that whisked us back to the start. At that point, the clouds had completely lifted and we were treated to unimpeded views of Milford Sound including impressive Miter Peak high above all.

## Kepler Track

We awoke early on February 28th and boarded the first water taxi under cloudy skies across Lake Te Anau to Brod Beach to begin our hike of the 4 day long Kepler Track. The trail immediately ascended the reaches of the mountain range, and we proceeded with slow, lethargic plodding through forest for 3 hours before reaching tree line. Just before leaving the forest, the sky seemed to open, the sun began to shine, and we realized that the clouds had not cleared, rather we had climbed above them. Above tree line were beautiful alpine tussocked grasslands with great views of Lake Te Anau below and mountains as far as far as the eye could see. A short distance further along the trail sat Luxmore Hut with all of the aforementioned views which we enjoyed from picnic tables with our lunches and Speights beer. The following day's forecast called for rain, so at the warden's prompting we continued further up the trail to Luxmore Summit to photograph the mountain ranges while they were still visible.

After dinner, most of the hut visitors read their books or turned in to bed, but Robert and I took our second side trip of the day in order to explore Luxmore Caves. Stories of the caves from others in the hut did not inspire confidence, but since we were experienced cavers, we knew we would be up to the challenge. We hiked and squeezed our way down the main passage for an hour before eventually reaching terminus of the channel and heading back for a restful night in the hut.

True to the forecast, the next day was rainy and cold and conspiring to spoil our day of hiking above treeline. Fortunately, the rain and wind remained light during the trek and the visibility actually afforded nice views of the surrounding landscape. After 5 hours of hiking including a steep, switchbacked descent, we reached Iris Burn Hut and settled in just as the rain began to really pour down from the sky. The third day of the Kepler Track meandered slightly downhill through mossy forest with ferns covering the ground. The uneventful day led to Manapouri Hut on the shores of the lake of the same name where we relaxed and chatted with the hut mates we had befriended the previous several days. We began the final day of the track early in the morning and made it to Rainbow Reach where I hitched a ride back to town retrieve the car so we could make haste to our next destination to the south.



## Catlins

With only a few days left in New Zealand and having just completed the Kepler Track, we sped south to tour the remote coastal region known as the Catlins. As we neared the coast, we couldn't help but stop at the roadside Clifden Caves, but the 45 minute exploration revealed graffiti and wear and tear that our previous caves were not subject to in their remote locations. Pushing on, we made it to Curio Bay just before sunset and were able to view petrified trees in the sea rocks and a few yellow eyed penguins while an Antarctic southerly pounded the coast with rain and wind. The next morning, we explored Slope Point that enjoys its claim as the southern most point of the south island then hopped into the car and moved east until we reach Surat Bay where we explored the beach and photographed sea lions. Driving further east, we made our last stop in the Catlins at Nugget Point where we hiked to the lighthouse and photographed scenery and sea lions hundreds of feet below at the base of the cliffs.

We then departed the desolate Catlins and slowly began our return to civilization when we reached the university town of Dunedin. Having selected Speights as my official New Zealand beer, I couldn't resist the brewery tour which concluded with 30 minutes of open bar that prepped us for a fun night on the town to celebrate with the locals who had just won an intense rugby game.

After 4 weeks of exploring New Zealand's south island and 2.5 months away from home, I found myself back in Christchurch where I began my Antarctic and New Zealand journey. Typically, the end of my travels are filled with with sadness of departure and wishes for just one more day, but as I boarded the plane in Christchurch, I was overcome with excitement to finally be returning home. In spite of the amazing adventures I had in Antarctica and New Zealand, I longed for the place that I truly feel happiest. Of all the aspects of this amazing journey, I realized that what mattered most was that I was able to walk away from my day-to-day routine, step into a completely different world, and return more grateful than ever to the life that I have been blessed with in Colorado and the good ole U-S-of-A.

**Sun Mar 25, 2012 | 10:29 PM |**
**-PB-**


blurb