

Antarctic Journal: A special edition of “Ask the Glaciologist”

Our blogger heads back to civilization — but first, he answers more of your questions.

Matt Siegfried

27 November 2015

CHRISTCHURCH, NEW ZEALAND

Matt Siegfried is a glaciologist on the [ROSETTA-ICE](#) field project in Antarctica. This research season, he's writing a [blog](#) for Nature about life in the field.

Well, that went quickly. This morning, I hopped on “Ivan the Terra Bus” for a ride to the Pegasus White Ice Runway, took one last picture of Mount Erebus, and boarded a [Royal New Zealand Air Force C-130](#) bound for Christchurch. Eight hours and twenty-two minutes later, I saw a living plant for the first time in almost a month. An hour after that, the Sun set.

Ivan the Terra Bus, the classic McMurdo airport shuttle.

Matt Siegfried

A parting shot of Mount Erebus, the southernmost active volcano on Earth.

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My transport off Antarctica: a C-130 flown by the No. 40 Squadron of the Royal New Zealand Air Force.

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I left McMurdo two weeks before the rest of the [ROSETTA-ice](#) crew to attend the 2015 United Nations climate talks in Paris (or “[COP 21](#)” — you can see *Nature's* COP21 coverage [here](#) and read about the Scripps Institution of Oceanography delegation, of which I am a part, [here](#)).

Leaving Antarctica was definitely bittersweet: I'm excited to experience the Paris climate negotiations, but it pains me to “re-deploy” before our data collection was done and our goals met.

I'm amidst a slog of travel (MCM to CHC to SYD to LAX to SAN, for a total of 26 hours in the air) and will therefore keep this post brief. I'll be back next week to wrap up the blog after I have had some time to digest the past four weeks and re-assimilate into regular society.

In the meantime, there were a few great questions that fell by the wayside during [last week's live chat](#) because I had to get back to work. My answers to those questions are below.



Read more of [Matt's Ice Diary](#)

Q: What's the first thing that froze up or broke on you?

A: During my first season (2011-2012), the first thing that broke because of the cold was my alarm clock, which was definitely sub-ideal. It worked perfectly in McMurdo, but then ran incredibly slowly in the cold. For my second season, I went out and bought a nicer alarm clock. It worked for two nights, then gave up.

Most electronics struggle in the cold — especially computer, phone, and camera batteries. It's not rare to see someone shoving a laptop up their shirt to warm it up enough to turn on.

Q: How long does it take to get used to perpetual sunlight? Do you actually get a tan down there?

A: Perpetual sunlight is fantastic — until it's time to go to sleep. My body never really gets used to it. I wake up every 2-3 hours at the end of every sleep cycle, when my body screams, “Hey Matt! It's light out! Time to get up! Let's go!” That said, I'm really good at falling back to sleep and don't have any problems getting 6-8 hours a night even though it's light out.

Get to know the local wildlife: skuas are a common sight around McMurdo Station.

After a week or two, I convince myself that I'm rested and sleeping well. Then I go back to New Zealand, watch the sunset, sleep like a log, and stop drinking half a dozen cups of a coffee a day.

And yes, you can absolutely get a great tan down here. Except you try to have almost no exposed skin. And the skin that is exposed is typically slathered in sunscreen to protect against the really high levels of ultraviolet radiation (thanks to a thin ozone layer) and the fact that the ground reflects sunlight back at you instead of absorbing it. There are some classic places you can get sunburned when working on a glacier (in Antarctica, or otherwise): bottom and inside of the nose, roof of the mouth, and the cornea.

Q: How do you feel about the inevitable environmental damage caused by the presence of researchers in Antarctica? How that impact is weighed up in decisions about what and how much research is permitted there — and who, if anyone, has oversight of that?

A: I offhandedly mentioned this issue last week in my blog post and it definitely deserves more discussion. As with everything I say here, I can only speak (or misspeak!) for myself, so you'll have to ask other researchers how they feel about it.

For me, I've stood behind LC-130s for hours while loading cargo and know firsthand what comes out of their engines. On the other hand, the Ross Island Wind Farm is always in view from McMurdo. Thanks to 24 hours of sunlight and constant winds, solar panels and small wind turbines provide much of the electricity for small field camps. We do our best to limit our footprint as much as possible both for ethical reasons, but also because the less money we spend burning fuel, the more money we can use for science.

McMurdo Station gets some of its electricity from a wind farm.

After five years, I think I have successfully convinced myself that our footprint is sufficiently small, given the wide-ranging importance of Antarctic research, but I do think we need to continually push to minimize it through smart planning, efficient work, and innovation.

The US National Science Foundation (NSF) makes all the decisions with regards to, well, everything, which includes weighing environmental impacts and potential scientific results. This process occurs both in the proposal stage and then again in the permitting stage before field deployments. We need to have a permit for any "release" to the environment, whether it is water, human waste, or fuel. The NSF actively works to reduce our collective footprint in Antarctica, and over the next decades, the NSF has plans to [rebuild McMurdo Station](#) to increase operational efficiency and function.

Q: What is the most important thing you have learned working in Antarctica?

A: The difficulty of scale. Before working in Antarctica, I had done some fieldwork in the Canadian Rockies, where you can fairly easily blanket a glacier with ground-based instruments and feel like you have a solid understanding of what's going on. During my last project in Antarctica, I used GPS data to track changes to the speed of an ice stream. I flew over one of my GPS stations and was blown away at how lonely and small the GPS installation looked on the endless expanse of ice.

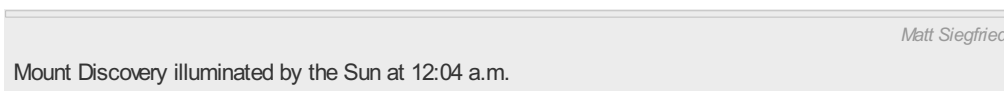


In a similar vein, with the ROSETTA-Ice project, we fly 2,000 kilometres (1200 miles) per mission and cross the Ross Ice Shelf only twice. To date, [we've flown nearly 20,000 kilometres](#) (about half the circumference of Earth) of survey lines and only have about 25% of the ice shelf covered. These scales are so big that they're hard to fathom, and making sweeping statements based on a single point measurement would be pretty silly. Solving the scale problem requires extensive collaboration between scientists who collect data from the ground, air, and space for us to make significant headway into observing Antarctica appropriately.

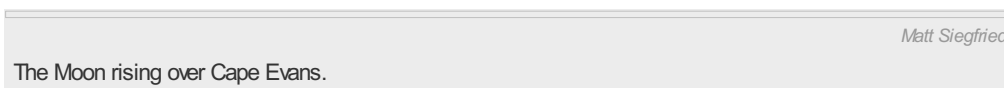
Q: What does the night sky look like from down there?

A: I guess that depends on your definition of "night". If you mean night as in "when it's dark out", I can't speak to that — I've only seen Antarctica in daylight. But even though the sun never sets, there are some differences between night and day as the Sun tracks a full circle through the sky.

Sunlight will reflect off different glaciers on the horizon like a mirror depending on the time of day. While I'm in town, I make a point to go for hikes around midnight, when the sun is above Mount Discovery. If the clouds are just right, oranges and reds reflect off the glaciers on Mount Discovery and it looks almost like the mountain is on fire.



Oh, and if you are paying enough attention, you can sometimes catch the Moon in the night sky.



Thanks again to everyone who submitted questions or just logged on to see what I had to say. I'm still a bit overwhelmed by all the interest! If you have more questions (or your original question fell through the cracks), feel free to ask me on [Twitter](#) or [Instagram](#).

Off to the Christchurch Airport,
Matt

Previous entry: [Why I don't tell people where I work](#) | **Next entry:** [Back home — but not for long](#)

