

The Antarctic Sun



Published during the austral summer at McMurdo Station, Antarctica, for the United States Antarctic Program

November 21, 2004



Photo by Brien Barnett / The Antarctic Sun

In the foreground are the new, nearly completed sections of the elevated station at the South Pole. Two berthing wings will be added this summer.

Construction cruises through polar night

By Brien Barnett
Sun staff

Standing in one of the nearly finished wings of the elevated South Pole Station, it's easy to imagine future residents wandering the newly constructed corridors, rooms and stairwells. Inside and out, the polar station is taking shape and is on target for dedication in 2007.

It happened overnight so to speak. The long, cold night called the austral winter saw crews pushing to get the interior of three new sections up and running.

"It's the fastest eight months I've ever spent," said Carlton Walker, facilities, maintenance and construc-

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Photo by Brien Barnett / The Antarctic Sun

Carpenter Robert Kummelehne of Fall Brook, Calif., cuts high-impact board inside the elevated station. The board lines the hallways inside the station.

QUOTE OF THE WEEK

"McMurdo Station's like a Club Med for scientists. Where else do I have so much done for my pleasure?"

- scientist in McMurdo's dining hall
talking about science support

INSIDE

Childhood stories lead man to Antarctica

page 4

A Polie's quick decision

page 12

Can't keep a good seal down

By Emily Stone
Sun staff

Seal researchers at Fat City figured it was a fluke when the first seal they put in the dive hole there failed to return. But when the second seal took off, lead scientist Mike Castellini knew something was wrong.

"Once they were in the water, they were gone," he said. "They didn't even come up for a breath."

Fat City is deliberately situated as far from any cracks in the ice as possible. This means that a Weddell seal located near the dive hole there has no choice but to return when it needs to breathe. That way the scientists can continue to take measurements and conduct tests on the same seal over the course of several dives. The researchers are conducting tests to learn more about how seals metabolize fat so efficiently.

Castellini, a professor at the University of Alaska in Fairbanks, believes that the unusually old sea ice is to blame for the seals' escape. There must be cracks nearby that the seals were able to reach. He thinks the cracks are caused by the increased pressure in the ice, which hasn't fully broken out since 1998. The cracks aren't visible to



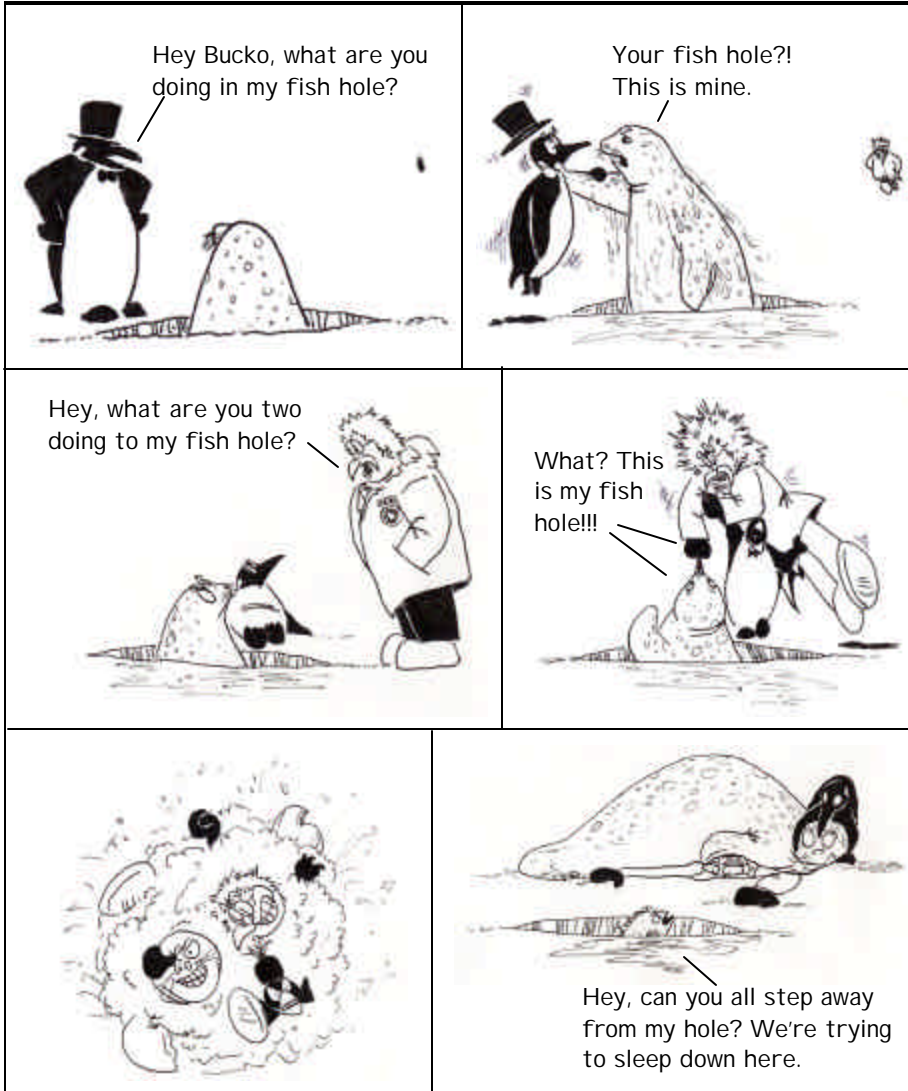
A Weddell seal and her pup rest on the sea ice.

Photo by Laura Hamilton / NSF Photo Library file photo

See Seals on page 11

Ross Island Chronicles

By Chico



Cold, hard facts

McMurdo Bowling Alley

Number of lanes: 2
 Date opened: **July 19, 1961**
 First ball thrown by: **CDR James J. Brosnahan, commanding officer of NAF McMurdo Station**
 Ceremonial pins: **toy stuffed penguins used for dedication ceremony**
 Cost today: **\$2 to bowl, \$1 for shoes**
 Number of teams in league play now: **30**
 Name of runoff for the losers: **Toilet Bowl**

Why it's special (besides being in Antarctica): **has manual pinsetters**
 Pin weight: **2lbs / 1kg**
 Average ball weight: **13lbs / 6kg**
 Average weight a pinsetter lifts per game: **1,040lbs / 472kg**
 Why they tell you this: **they want to be tipped**

source: Pictures and signs at the bowling alley.

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Penguin at New Harbor camp Photo by Henry Kaiser

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Cold challenges South Pole filmmakers

By Brien Barnett

Sun staff

Harsh -50C temperatures set in as a National Geographic Television film crew filmed life at the bottom of the world during a visit this month to the South Pole.

"It's going pretty well," said cameraman Michael Single, of the second summer of filming in the the three-year project. "The thing that has been a bit of a setback is the machinery and construction are not going yet."

The crew's early visit to the station, combined with the low temperatures, meant filming of construction and cargo movements will have to wait until next year. In the first year, the crew taped inside buildings and talked with people. This year, Single and his partner, soundman Adrian Kubala, did get some nice shots of planes taking off from the ice runway next to the new elevated station.

"The contrails were just fantastic," said Single, an Emmy award-winning cameraman.

Besides the shots, the primary concern for the pair from Dunedin, New Zealand, was keeping the gear functioning in the cold. Single kept the camera battery inside his clothes next to his chest to keep it warm. Kubala used a dual system that used digital audiotape or a minidisk to record sound. He had to stop using a wireless transmitter to get his audio because it wouldn't stay on frequency. Neoprene covers also helped keep the gear insulated.

"At about -45C things start to go wobbly," said Single, who has visited the continent 20 times. This is Kubala's third trip to the Ice.

"Pole is different from most experiences," he said. "It's pretty taxing. Like diving, you have to keep changing into your gear all the time."

They used their time at Pole to shoot scenes of essential services and utilities, take a tour, videotape the underground ice tunnels and pick up a number of detail shots from their list. The documentary will use computer graphics, which may lessen the need for some shots, Single said.

Other effects of the winter surprised them.

"There's been such a lot of snow buildup at MAPO and the El Station," Single said, referring to the astronomical sciences building and the new elevated station.

Tractors and other heavy equipment spent several days clearing away snow from buildings at Pole and building up snow berms that help block the wind.



Photo by Brien Barnett / The Antarctic Sun

National Geographic cameraman Michael Single, dressed in his extreme cold weather gear, descends through a tube leading to tunnels beneath the Dome at the South Pole. The tunnels are very cold and have a lot of metal pipes and ducts. The cold weather clothing keeps visitors warm and reduces risk of exposed flesh sticking to the metal.

"At about -45C, things start to go wobbly."

— Michael Single, cameraman for National Geographic, on filming at the South Pole

Kubala and Single were at the South Pole last summer with adventure sports film director Michael Brown to record scenes of the transition from the old dome into the new station. Brown has moved on to work with a different project this season, an expedition set for January on the Antarctic Peninsula. Single and Kubala said they plan to be back at the Pole again.

"We'll be returning next year to chip away at the changes," Single said. "The changeover (to the new station) is a new aspect ... and ideally they will have the blue panels on the outside of the station by then, sort of have on its best dress."

Single isn't taking a break, just reversing cultures. Next, he will leave

the cold and chilled-out pace of the South Pole and travel to Las Vegas for filming in Death Valley.

The National Geographic documentary, supported by the National Science Foundation, probably will be ready to air around the time the new station is dedicated in 2007, Single said.

The Antarctic Sun Photo and Writing Contest

Entries due Dec. 12
e-mail them to
The Antarctic Sun at
antsun.mcmurdo@
mcmurdo.gov

Photo Categories:
Scenic
Wildlife
People
Other
film or digital
(300 dpi or higher, please)

Writing Categories:
Poetry: up to 30 lines
Haiku: 5-7-5 syllables
Microfiction: up to 300 words
Non-fiction: up to 300 words



Perspectives Perspectives

Antarctica is the Top of the World

By Casey Kochanowski

I first heard of Antarctica in first grade, in a one-room country school. Our teacher was lecturing the upper grades about Wisconsin's geography. I pretended to read Dick and Jane, as assigned, but I wasn't. I was listening to the adventures the lucky older kids were being told.

"Thousands of years ago much of Wisconsin was covered with snow and ice about two miles in height, much as is in Antarctica today. Glaciers—large sheets of ice—altered the landscape on a massive scale. Wisconsin's lush green pastures, towering forests, its many streams and lakes, and even the Great Lakes, were formed directly and indirectly by a continental glacier, named Wisconsin. ... Look in the *National Geographics*. You'll find articles about glaciers and Antarctica. ..."

My child's mind tripped with fantastic ideas and dreams. I pictured a howling blizzard lasting a thousand years, piling snow higher and higher, then drifting it up two miles. In the blinding fury I climbed to the top. I was king of the hill. I didn't understand how packed snow that squeezes into ice could make pastures and trees. If the rivers and lakes were formed directly and indirectly at the same time, that must be why they're in all different directions on the map, I thought. The teacher showed Antarctica being on the bottom of the world, upside down from us. Was Antarctica some kind of magic place with special stickiness?

Every chance I had, I searched the yellowed magazines for articles about Antarctica. The journey took a long time, for Antarctica was far from central Wisconsin and the world was filled with enticing detours. Sometimes I didn't go to recess because I was deep in a jungle surrounded by tigers or inside pyramids studying dead kings' tombs. Eventually I found photos of men in heavy winter clothing surrounded by snow and they weren't Eskimos. My heart skipped a beat, for these were the men of Antarctica. They wore huge, Eskimo-like jackets, white chubby boots, mittens big as gunny sacks and sunglasses like movie stars. Most of them had messy, sticking-up hair. When they were outdoors their beards were frosty and hung with icicles, making them appear scary and mean. I wasn't afraid. These were not bogeymen. They were courageous glacier explorers. I'd

do anything to be with them, even let them be king of the mountain. They were heroes.

On Saturday, Oct. 30, 2004, as all-hands arrive to the McMurdo dining hall for a town meeting, I inquire of the kind-eyed, seemingly mature-beyond-his-years man on my left. "I've seen you about. What kind of work do you do?"

"I'm with the South Pole Traverse. John Wright, and you?"

"Sheet metal, Kochanowski, Casey," I reply, extending my hand.

I am deeply moved. The little boy who would do anything to be in Antarctica is in the presence of this high drama. In my responsibility on the Ice as a sheet metal worker, I am supporting today's glacial pathfinders in the advancement of greater polar understanding. Recently, we of the sheet metal shop fabricated special angle brackets for the South Pole Traverse. Every gear of support, regardless of size, age and location, is required to keep driving the engine of scientific research on the Ice.

I, too, have a support team making possible my sojourn in this crystal paradise. Brenda, my wife of 33 years, voice of kindness, intelligence and encouragement, mother of our three children, is home alone. This is the first time we are apart for so long. In our waltz together a natural rhythm of routine, spontaneity and responsibility has evolved. In addition to her usual daily domestic duties, she now is also tasked with activities that I usually handle. Brenda must now take care of our vehicles, scrape smelly road kill off the highway in front of the building site and explain my sabbatical to our customers and neighbors. This will be her first winter in a long time of having to snow plow our residence, farm and metal fabricating business. She's doing all that so I can spend the summer on the beach of an island in a far away southern sea.

Though our children are far from home, chasing and fulfilling their dreams, they are active members of my support team.

Parents are supposed to make connections on behalf of their children. In my situation, the roles were reversed. Late August 2003, Amnesty, 23, trail crew/hot shot in Rocky Mountain National Park, calls home.

"Dad, you won't believe this. Antarctica wants you. They need sheet metal workers."

Immediately Brenda sends my resume, but it is too late for the 2003-04 season.



Photo by Brien Barnett / The Antarctic Sun

Casey Kochanowski is a sheet metal worker from Wisconsin, currently in his first season at McMurdo Station.

This year we are ready. Amnesty attends the Raytheon Polar Services job fair in Denver in April, for she, too, likes cool places. The marathoner snagged a slot as an alternate, cargo, for the Pole. At the maintenance/construction table, Amnesty hands my resume to the recruiter. He whistles, "Holy *@%&, this guy's got experience."

Forgiveness, 25, logistics officer, US Air Force, Elmendorf Air Base, Alaska, would probably rumble his Harley to Wisconsin to hogtie me on the airplane, had I second thoughts about going to Antarctica.

"Dad, you've got to go. You love glaciation. You always taught us where the lobes invaded, how the lakes were formed ... You'll never get another chance. Don't worry, mom will be fine."

Deliverance, 21, loadmaster, C-5, U.S. Air Force, Travis Air Force Base, Calif. is my advance party. Two years ago he had a mission to Christchurch, New Zealand.

"Dad, stay at the Sudima Hotel. That's where the Air Force puts us up. You'll be right next to the Antarctic complex. Mom will be fine. I'm coming home for deer hunting. I'll show her the tricks of snow plowing. Go to Antarctica and have fun."

The seventh continent is topsy-turvy. Everything here is strange and different. They plow snow onto the roads because it rarely snows. People try to dispense with slumber because it doesn't get dark all summer. There are no designated drivers because there are no automobiles. There are no babies here, only fun-loving kids of all ages. There's a mayor, but he looks just like all of us penguins in red jackets.

I love Antarctica. I knew I would. I cannot hold her close enough. For nearly 50 years I've been dreaming about Lady Antarctica, and finally now, I waken to her embrace. She flirts with me, winks. For a chilling second, aurora australis illuminates eternity.

around the continent

SOUTH POLE

Record-setting week

By Katie Hess

Pole correspondent

This week marks the anniversary of the first flight over the geographic South Pole, a new record low temperature, and the end of the contrails that had been making unloading cargo planes difficult.

This year marks the 75th anniversary of American Admiral Richard E. Byrd's flight over the Pole. Byrd was the navigator aboard the Floyd Bennett — a Ford trimotor aircraft. The expedition signified the first step in the mechanical era of Antarctica exploration. More coverage of the historic flight, and a modern one commemorating it, will come out next week in *The Antarctic Sun*.

After setting a record low of -48.7C on Nov. 10, temperatures finally rose above the -40C mark for the first time this season. It feels relatively warm compared to the frigid start of the season and cloud cover, ice crystals and blowing snow are nearly non-existent. The warmer temperatures have been welcome news to summer operations.

The thick contrails that until now had obscured the vision of crews attempting to unload planes have subsided. That has allowed cargo to be removed from the rear of the plane and for other cargo, including tons of winter waste, to be shipped back north. Fragile cargo that had to wait for the contrails to disappear, including some of the larger IceCube hot water drilling equipment, is now moving toward Pole. Departments up and down the supply chain from the U.S. to South Pole are feeling the relief of the faster flow of cargo.

Warmer temperatures also mean that more vehicles can be operated around the station. Crane operations are starting up this week for the summer season, a passenger van will begin a scheduled route around the station and getting from place to place at the bottom of the Earth is becoming easier.

This last week also has brought some relief to the medical staff that hit the



Photo by Brien Barnett / *The Antarctic Sun*

John Gallagher takes a weather balloon outside.

ground running this summer with so many visits from patients suffering cold and flu-like symptoms. The record 119 patient visits at Pole in the span of a couple weeks exceeded even McMurdo's weekly count. Much healthier faces are present everywhere around the station.

South Pole Emergency Response teams are gearing up for the station's first ever Mass-Casualty Incident drill. Christian Otto, South Pole Station's medical doctor, gave tips from previous drills held at McMurdo Station. The goal is to design a plan suitable for the remoteness of South Pole Station.

The meteorology department recently installed a brand new upper air system for monitoring data transmitted back to the station from our weather balloons. The system uses much smaller, state-of-the-art radiosonde units to measure weather through the polar troposphere.

In recreation, about a third of the station attended this summer's first "Full Contact BINGO." This tradition is a very well-attended event at the South Pole and proved to be another outstanding success. Also, several groups are fitting in last-minute practice sessions for performances at the popular coffee house event. Each year, the coffee house features remarkable performances by the station crew and scientists. For those on station, it's an event not to be missed.

PALMER

Krill researchers return

by Kerry Kells

Palmer correspondent

Palmer Station has been busy preparing for the next port call. The sea ice has again strengthened. From atop the glacier the sea ice is a blanket of white in all directions, packed tightly around each of the islands. The research vessel *Laurence M. Gould* delivered National Marine Fisheries researchers and their gear to Cape Shirreff on Livingston Island, then continued on to Palmer Station. The ship arrived Thursday and departed Friday.

Before the ship's arrival, Langdon Quetin presented the Wednesday night science lecture on krill, complete with the unique snack of "krill crackers." Quetin is principal investigator with the prey component of the Long Term Ecological Study, which studies krill.

Quetin and Robin Ross began krill research at Palmer Station in the early 1980s and are currently researchers with the Palmer Long Term Ecological Research Program (LTER) which began in 1990. Langdon's lecture discussed the biology of Antarctic krill, *Euphausia superba*. His lecture began with a brief overview of the life history of krill, discussed the importance of sea ice to larval krill survival, summarized their 10 years of catch data in the Palmer LTER grid and ended with predictions for the krill population in the area. Langdon's group dives to collect krill around station and trolls for krill from zodiacs. He credits volunteer help from his team members. The volunteer divers on station now are Katharine Schwager and Joshua Sprague.

Krill are a shrimp-like crustaceans whose size (up to 6cm), abundance and circumpolar distribution make them a key species in the ecosystem of the Southern Ocean. Krill form schools that can be kilometers in length. Concentrations in these schools can be as high as 10,000 individuals per cubic meter. Krill feed primarily on phytoplankton (small, single-celled plants),

See Palmer on page 6

the week in weather

McMurdo Station

High: 37F / 3C

Low: 12F / -11C

Max. sustained wind: 50 mph / 80 kph

Windchill: -32F / -25C

Palmer Station

High: 44F / 7C

Low: 22F / -6C

Max. sustained wind: 52mph / 84kph

Precipitation: 24mm

South Pole Station

High: -24F / -30C

Low: -43F / -42C

Peak wind: 31mph / 50kph

Max. Physio-altitude: 3,191m

Palmer From page 5

sweeping them from the water column using feeding appendages.

Growth and reproduction of krill vary with the availability of phytoplankton. Krill grow most rapidly during the springtime, when the ice melts and the water column blooms. During the periods or years when food levels are high, krill have a high growth rate and may spawn more than once during the summer spawning season. When food levels are low, especially in winter, krill may not grow but may actually shrink and they may not spawn in the summer months.

The timing and extent of pack ice formation and the amount of light for ice algae production in sea ice is significant for the success of krill. One key period for krill population is the survival of larvae during the winter months when their ability to starve is limited. They must feed on phytoplankton incorporated into the pack ice (ice algae) because the phytoplankton in the water column is low.

As part of the Palmer LTER, Langdon and Robin study the patterns of krill at 46 stations within the LTER grid south of Palmer Station. Each year, with the help of many volunteers, they measure krill from each station. The combined measurements provide a picture of the size and structure and abundance of krill population.

The data show that krill recruitment and abundance is cyclical with two successful years of recruitment followed by three to four poor or failed years. These two successful year classes dominate the krill population and are closely tied to winter ice dynamics. Since the warming trend in the western Antarctic Peninsula is negatively affecting the annual sea ice dynamics, a negative impact on the krill population may also be likely.

Langdon and his team members dove

quickly in Hero Inlet before the next port call. With the arrival of the *Laurence M. Gould*, new scientists arrived at station. Principal investigator Tad Day and co-principal investigator Christopher Ruhland will continue research of the "Response of Terrestrial Ecosystems along the Antarctic Peninsula to a Changing Climate." The artist and writer, Jude Nutter, also arrived on station. Her background is both in painting and poetry. And, as of this Tuesday morning thanks to the wind, Palmer Station welcomes the open water.

SHIPS

Nathaniel B. Palmer

Compiled from reports by Karl Newyear

The *Nathaniel B. Palmer* continued south, crossing 60 degrees South Nov. 11 to return to the Antarctic. The 60-day science cruise has now passed its halfway mark and continues to draw water samples and deploy instruments measuring the water temperature, salinity and other characteristics.

The seas lulled as the ship entered the northern Ross Sea ice pack.

"The winds and seas have finally calmed and we're able to leave things on counter-tops without fear of them catastrophically ending up on the floor," wrote marine projects coordinator Karl Newyear.

Winds were also down with a steady barometer. Satellite imagery suggested the Ross polynya, a clear area in the sea ice, was starting to open up. Except for a lone Ross seal seen on the ice Nov. 13, wildlife sightings were scarce until a number of killer whales appeared mid-afternoon Nov. 16. The researchers and crew celebrated third mate Rachelle's birthday and enjoyed a seminar by researcher Raul Guerrero on his recent road trip to Machu Picchu from his home in Argentina.

As the ship progressed toward Cape

Adare the researchers started to see a distinct algal layer on the bottom of overturned ice floes, suggesting that the spring bloom can't be far off. The weather worsened, with east winds mostly closing the shore polynya northwest of Cape Adare the ship had been heading towards, putting their plans into flux.

Laurence M. Gould

Compiled from reports by Herb Baker

The *Laurence M. Gould* delivered researchers to their campsites along the Peninsula. The ship arrived first at Cape Shirreff on Nov. 10 to find it shrouded in fog. They waited for the sun to rise and lift the fog, which it did within an hour. That allowed the crew to move cargo ashore by Zodiac and set up camp for National Marine Fisheries researchers.

The *Gould* continued south to Palmer Station to deliver cargo, then on to Peterman Island to set up a camp there for researcher Ron Naveen. Naveen gathers population data on penguins there to see how they may be impacted by the frequent tourist visits.

From there, the *Gould* went to Copacabana field camp on King George Island, where Wayne and Susan Trivelpiece have studied Adelie, gentoo and chinstrap penguins for 25 seasons. Three people went ashore to repair the broken wind generator mast and do several other small repairs and projects. While these three were working at Copa, the *Gould* went to the Argentinian Jubany Base to deliver an all-terrain vehicle that will support a project on Vega Island, then to the Chilean Frei Base to pick up some instrumentation for Teri Chereskin. Chereskin studies the currents in the Southern Ocean with regular samples collected during the *Gould's* passages back and forth across the Drake Passage. The *Gould* returned to Copa to pick up the three workers and Susan Trivelpiece. Then the northbound ride to Punta Arenas was reasonable, but wet and foggy.

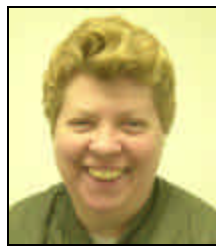
Continental Drift

What's your coldest Antarctic experience?



"Minus 108F degrees in 1993 at South Pole."

Bill McAfee,
South Pole
IT manager from
Denver, Colo.
many seasons



"Minnesota."

Zee Evans,
Palmer maintenance
specialist from
Minneapolis,
nine seasons



"Doing 'hero shots' at the South Pole in zero clothes at 64 below."

Kai Lindemulder,
McMurdo general
assistant, San
Francisco, first season

Ramps may be causing columns to settle faster

By Brien Barnett
Sun Staff

The new, elevated station had to be raised several centimeters a couple years ago. That was about 14 years ahead of schedule. Now there may be an answer as to why.

According to Jerry Marty, the National Science Foundation representative in charge of construction, the north side of the South Pole station appears to have sunk faster into snow and ice than expected because of two ramps that were built to help move construction supplies in and out of the building.

“The snow ramp was point loaded at adjacent columns,” he noted.

He explained that engineers determined the weight of the ramps had compacted the snow around nearby support columns, causing the columns to sink faster than expected.

However, a year after the A Pod ramp was built, the settling seems to have slowed, he said.

He said he hoped the same would happen



Photo by Brien Barnett / The Antarctic Sun

Inside the construction area, workers have built a snow ramp up to the station to move material in and out of the building. The weight of the ramp at the top end seems to be compacting snow near the support columns.

for the B Pod supports.

“It’s kinda like a domino on a bowl of Jell-O,” Marty said about the annual task of keeping the station level.

This year, one or two columns will be set level and jacked up a bit. The process will take a couple weeks and requires several 136-metric ton, heavy-lifting jacks.

Once construction is finished and ramps

are removed, Marty predicted the settling would range about two to five centimeters a year.

Online: To learn more about the jacking and leveling process, check out this archived story in the Civil Engineering Magazine at <http://www.pubs.asce.org/ceonline/1200feat3.html>

Pole From page 1

tion manager. Walker manages the construction crews at South Pole Station.

With a few exceptions, that crew has handed the finishing touches to the men and women of summer and departed for warmer climates, though many will return for another long night of work.

“We’re exactly where we want to be,” said Jerry Marty, the National Science Foundation representative in charge of construction on the new station.

Compared to the cozy but cramped surroundings of the geodesic Dome that has been the symbol of the South Pole since 1975, the elevated station feels like a modern office building with bedrooms. The key word to describe the new station is “room.” Room to move, room to work, room to live.

The new station is elevated three meters above the snow and ice by dozens of steel columns.

The columns, which are being adjusted again to level the station this season, support two, two-story main sections — A and B. The sections each resemble a blocky

letter “C” if seen from above.

Both sections contain four segments, or pods. Three of the four pods of each section have been erected and enclosed. A foundation of steel columns and beams erected last summer mark the fourth pods of each section. Both remaining pods — A4 and B4 — will be framed in, enclosed and heated by the end of summer if all goes as planned.

In the A-section, all three of the enclosed pods are finished and occupied. Those pods house the dining hall, kitchen, medical center, station store, post office, computer lab, greenhouse and the first berthing area to be occupied for the winter, the A1 Pod.

Two of the B-section’s three pods are nearly finished. The B2 Pod will be the home to many science projects currently at Skylab as well as new science and computer space.

“All that’s left is pulling cables and some flooring,” Walker said.

Pod B1 is the berthing and emergency wing. Besides bedrooms, a game room, and television lounge, the wing is home to

“We’re exactly where we want to be.”

- NSF construction representative Jerry Marty, describing the pace of the progress on the elevated station

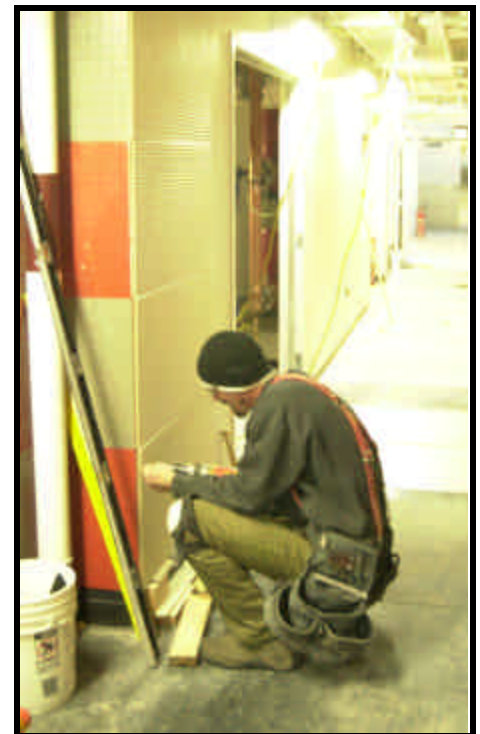


Photo by Brien Barnett / The Antarctic Sun

Carpenter Todd Nennich, of Anchorage Alaska, places high impact board on the corridor walls on the second floor of the elevated station at South Pole. Though he works with concrete back in Alaska, this is Nennich’s fifth season as a carpenter at Pole. He said his job in Antarctica is “good seasonal work,” which gives him some variety.

See Pole on page 10

.....The Elevated Station at South Pole

South Pole Station's past and present

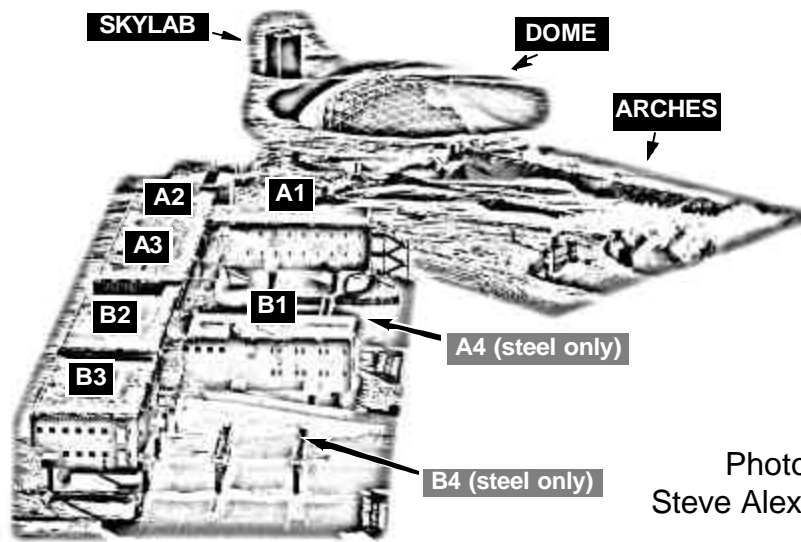
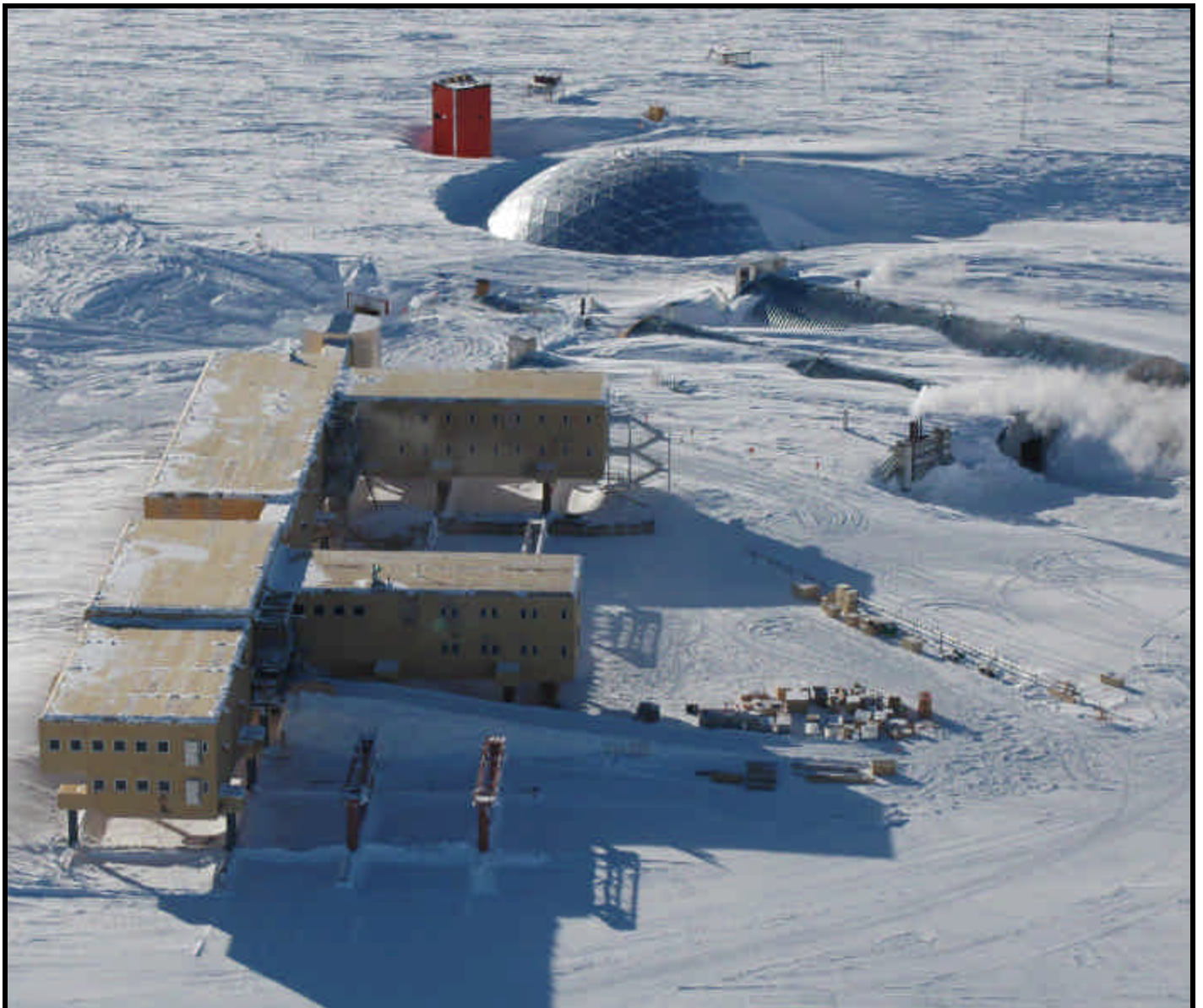


Photo courtesy of Steve Alexander / NSF



.....The Elevated Station at South Pole.....



1999



2001



2003



2004

Aerial photos courtesy NSF / Special to *The Antarctic Sun*

Staff keep close eye on power

By Brien Barnett
Sun Staff

South Pole station is in many respects a very small city. It has the same basic needs as a city for power, water and sewer.

According to Jerry Marty, NSF representative overseeing construction, the station is meeting the power demands, but is close to its maximum output of about 750 KW.

A new 250 KW “peaking generator” is scheduled to come online soon to give support to radio telescopes that draw large amounts of power and “spike” the system.

The secondary generator and the main operating generator would be able to produce a megawatt of power when needed.

“We’re closer to our maximum because we have more online than originally planned,” Marty said.

More science, an additional 40 beds and bad weather have contributed to the tight power supply.

Marty said conservation and planning will get the station past the power crunch, which should be resolved in the next couple seasons when the buildings inside the Dome and elsewhere are removed from the grid.

Efforts to curtail power use along with modifying power requirements for new science projects may also help the situation, Marty said.

Management is reviewing options for energy efficiency and conservation.

Meantime, all power is generated using fossil fuels, which are flown in and stockpiled in tanks for the winter. There is a limit to how much fuel can be moved and stored, Marty noted.

As for water and sewer, Marty said the station’s summer population of 245, which includes construction work, has pushed the station capacities for both to maximum levels of sustainability.



Photo by Brien Barnett / The Antarctic Sun

Inside the new station store, Aaron Skinner, far right, a meteorologist from Denver, talks with Patrick McClure, a helpdesk staffer from Denver.

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a small kitchen, a radio room, backup generators and fuel tank, water storage, bathrooms and laundry facilities. This would be home to the station's residents should other parts of the station become uninhabitable during the winter.

In Pod B3, carpenters and other craftsmen are finishing an area that will be the primary home to communications and administration. After many years holed up inside a room inside an orange building inside the Dome, radio and communications operators will have a commanding view of the runway outside and will be able to watch planes as they land and take off. The B3 Pod should be completed by next summer. Meantime, communications staff will begin migrating equipment to the area. Utility areas and a temperature-controlled network operations center are downstairs.

Altogether, the crews added about 30,000 square feet of new space since last year at this time — much of it painted in sea pearl, an off-white color Walker calls the “color of everything.”

“We used 900 gallons this winter alone,” he said.

Full summer crews

About 90 people are working on construction at the South Pole this season. Other projects besides the new station include building a new pad for the planned 10-m radio telescope, scheduled for 2007, and the massive IceCube neutrino detector. The detector requires dozens of holes in the ice to be drilled up to 2,000m deep and the set up of a support building. A building currently located near the Dome and previously used for housing will be renovated and towed over to the project area to house comput-

ers and equipment that will sort and count neutrinos — high energy particles from space — as they register within the detector.

The progress of construction means a summer of transition for many, including the kitchen staff. The elevator in a tower connecting the new station to an underground passageway to the dome is out of service. Packages of food are pulled from storage areas inside the dome and brought to the foot of the stairs. A sign on the stairwell asks passersby to pick up a box and bring to the kitchen. Two weeks ago, a utility crew rigged a hoist so the boxes can instead be brought to the front of the station by snow machine and sled and then lifted to the second floor.

“I couldn't thank them enough,” lead chef “Cookie” Jon Emanuel said. “I don't think anybody realizes how much work that was.”

10 days extra

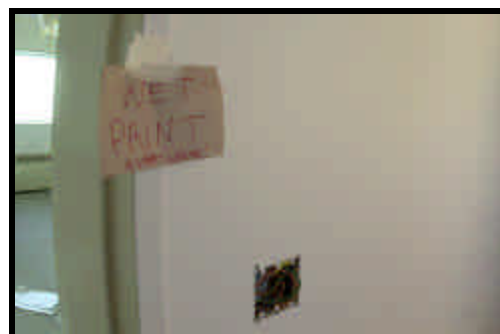
Twenty-eight construction workers will get 10 extra days to make a final push on summer work on the elevated station.

The National Science Foundation and Raytheon Polar Services agreed to extend the South Pole summer construction season to ensure the station is on track for a 2007 completion and possibly get ahead a bit, according to Marty.

“An additional 10 days of construction (allows for) work inside the wings,” Marty said.

As well, Marty said the extra days will allow the project to accrue time and to keep pace for the 2007 station dedication.

It also will allow work to progress earlier than planned on the interior of the IceCube “counting house.”



Top: Windows give a warm feel to a new room in the B1 Pod.

Middle: A sign in the B1 Pod warns of “Wet Paint Everywhere.”

Bottom: Emergency power generators will be at the ready when the pod is up and running.

Photos by Brien Barnett / The Antarctic Sun

Seals

From page 1

the researchers, though, because they're covered with snow. The enormous icebergs that broke into the Ross Sea in 2000 are acting as a breakwater before McMurdo Sound, reducing the likelihood that the ice will go out any time soon.

Castellini also suspects the seals can read the underside of the sea ice like a map. And since they've had the same map for so long now, they didn't even need to pop back to the surface to orient themselves before swimming away for good.

One seal a season usually makes a break for it instead of cooperating in the diving research, Castellini said. But it makes no sense to keep putting seals in the dive holes if they all keep leaving. So the team is going to concentrate on other, above ground, aspects of their metabolism study this season, which include doing tests on adult females and pups.

This switch in plans might lead to some exciting new research opportunities for the group. There are significant changes in the seal population this season beyond their ability to leave Fat City on their own.

Another Weddell seal project, led by Robert Garrott of Montana State University, counted about one-third to one-quarter as many pups as there should be at colonies this time of year, and a corresponding drop in pregnant females. Garrott said he does not know where the missing females are. And Castellini's team has found some seals at cracks in the sea ice this year where they don't usually congregate. These "rogue seals" as he calls them, aren't enough to make up for Garrott's missing seals, nor were they pregnant.

"Something has hit the system," Castellini said.

The question is whether the changes in sea ice are causing a physical barrier to the seals, making it difficult or impossible for them to reach their usual breeding grounds, or if the sea ice changes are affecting the ecosystem in such a way that it's no longer a good place for seals.

"Something has changed," Castellini said. "And the question is if it's food or ice."

His team hopes to study the rogue seals this season. By taking samples of hair, blood and whiskers, the scientists could learn what the seals are eating. The scientists would then compare that information to data from previous years to learn if the seals have changed their diet recently. This knowledge will help with seal conservation efforts.

"Transitions are usually the hardest things to catch," said fellow seal researcher Lorrie Rea, with the Alaska Department of Fish and Game.

This opportunity for scientists to track a change in population as it happens is exactly what scientists were unable to do after the



Photo by Emily Stone / The Antarctic Sun

Mike Castellini looks at an empty dive hole in the sea ice at his Fat City field camp. Castellini and his team of seal researchers had planned to study seals as they dove and resurfaced at the hole. But that work has been put on hold after the first two seals the scientists put in the hole escaped through unseen cracks in the sea ice nearby.

Exxon Valdez spill in Alaska, Castellini explained. Scientists had almost no data from before the spill on the affected animals in order to analyze the changes that happened after the spill.

"If this truly is the beginning of a change, we're sitting here right on top of it right now," he said. "It could be just fabulous."

Changing priorities

In the meantime, the scientists have not given up on their original plans for studying seal metabolism. They're just changing their priorities some.

Their goal is not so much to understand seal metabolism for its own sake, but to be able to use that information as a benchmark against which to compare other large carnivores.

"We know next to nothing about how wild carnivores digest food," Castellini said.

The seals, which are huge but generally not aggressive, make much better subjects than, say, a bear or wolf, Castellini said. Scientists would be hard pressed to find a grizzly willing to let researchers take hourly blood samples, as the seals do.

The team worked on this project in 2002. They brought six seals to the Fat City dive hole. The scientists drew blood each time the seal surfaced after a dive. They monitored how quickly controlled levels of fat, carbohydrates and nitrogen, which is a component of protein, lasted in the seal's

blood. The quicker the substance disappears, the more important it is to the seals, Castellini said. Something that's unimportant just sits around, unused in the blood for a long time.

The 2002 study showed that fat, or lipids, disappear in about 40 minutes, carbohydrates in a couple hours, and nitrogen gets partially used in 48 hours, but can linger for six months, Castellini said.

The team planned to do the same thing this year to gather more data and increase their sample size. They also wanted to conduct the same tests on seals that were not diving, but remained on the surface throughout the process. And they planned to do a series of tests on pups, to analyze their lipid metabolism. The pups are basically on a lipid diet from their mother's milk, which is 40 to 50 percent lipid, Castellini said.

Since the diving seals aren't cooperating, the team is going to concentrate instead on the surface seals and the pups this season. The results could shed light on how other wild carnivores digest food.

Castellini uses an analogy of a doctor who can take a person's temperature and know, based on that, if the person is ill. The doctor knows that because humans have had their temperatures taken so many times that it has become clear what a normal temperature should be.

The seal scientists are trying to figure out what normal metabolism rates are for pinnipeds, the category of marine animals that include seals, sea lions and walrus.

Rea's specialty is the Steller sea lion, which are an endangered species in most of their habitat. Researchers can often only get a single blood sample from the sea lions. It's difficult to know whether the animal is nutritionally healthy if researchers have nothing to compare that sample to.

"This gives us a framework where we can go out and understand one sample," Rea said of the seal tests.

The work also has implications for understanding human metabolism.

Seals eat and process an enormous amount of lipids, yet they show no sign of arterial sclerosis, which plagues many people with high-fat diets. Castellini's background is in comparative physiology, so his goal is to compare different animal's biological mechanisms for handling a given problem. If you want to study lipids, he said, then you take an animal that processes them poorly and compare it to an animal that processes them well. Then you try to learn from the animal that is doing something right.

For any challenge in biology, Castellini said, "there is an animal that has solved this problem. Your job is to find the animal and ask the right questions."

NSF-funded research in this story: Mike Castellini, University of Alaska at Fairbanks

Profile Spur of the moment Polie

By Kristan Hutchison

Sun staff

Glen Kinoshita has a habit of going to the ends of the Earth on the spur of the moment.

He chose his graduate school after poking his head into Walter Oechel's lab at San Diego State University. The lab assistant began telling him about their work in Barrow, Alaska.

"At the end of the conversation he asked if I wanted to go work there for the summer," said Kinoshita, who was in Barrow a month later working as a field technician for the Global Change Research Group. "Opportunities just kind of pop up and I just happen to be free enough to be able to take them."

His decision to come to Antarctica was equally sudden. He was finishing field research for his master's thesis in Barrow and trying to decide where to go next. A friend gave Kinoshita's name to Andy Clarke, with the National Oceanic and Atmospheric Administration observatory at Barrow. Clarke was looking for someone to send to the NOAA South Pole observatory for the winter.

"I called him and pretty much offered him a job pretty quick," Clarke said. "We want someone with relevant experience with the instruments we have and he was one of those."

The catch was Kinoshita had to start work in two months and stay at the South Pole for a year.

He packed up his thesis and went.

The thesis he meant to finish during his year at the South Pole never got written. It's no wonder, considering the topic is an ecosystem 17,000km away. For a year, the only plants Kinoshita saw were in the greenhouse and the only animals were other people.

But Kinoshita believes the experience was worth delaying his master's degree another year.

"I was looking for some place more extreme, just to see how I would do, just to challenge myself," Kinoshita said. "I'm taking away that experience and I think it's been good."

Despite the differences in ecosystem, or lack of ecosystem, the South Pole attracts similar people as Alaska's most northern village, Kinoshita said. He found the people particularly friendly in the Antarctic, where there are no permanent residents.

"Here it just feels like it's more temporary," Kinoshita said. "So you get off the plane and everybody's your friend."

He found he fit in well, organizing regular movie nights in the library and parties



Photo by Kristan Hutchison / The Antarctic Sun

Glen Kinoshita holds a flask containing air collected at South Pole earlier this year. Kinoshita recently left the Ice after spending the winter, but will return next winter.

on the full moon. He also volunteered in the greenhouse and once made sushi in the kitchen when the cooks had a day off.

"The key to having a good time up here is to do stuff and to actually contribute to the community, not just be passive and take things in," he said.

Kinoshita also kept in touch with people back in the U.S., posting daily photos and descriptions of life at the South Pole at his Web site, as well as sending the occasional irreverent or humorous e-mail to a list of 95 friends and acquaintances.

"It was a great way to bring us into his world, and to try to capture a glimpse at some of the research and work that is being done," wrote Jenny Pedrotti from Los Angeles, a friend of Kinoshita's for seven years.

"I don't know many people that would pack it all up and move to the South Pole, but Glen is without a doubt a true 'mad scientist', at least to us," Pedrotti wrote. "He is an extremely intelligent person, and one that will definitely make a difference in the world."

Kinoshita was outside in the winter weather daily, during his walk to and from the Atmospheric Research Observatory (ARO) in the Clean Air Sector, an upwind area at the South Pole where planes and other vehicles are prohibited. At ARO, he

kept the instruments working, collected air and snow samples, and helped launch ozone-monitoring balloons.

Though they were different disciplines and at opposite ends of the Earth, Kinoshita's research in Barrow and at South Pole are connected. Both look at aspects of climate change. In Barrow he monitored the effects of climate change on the ecosystem. At the South Pole, Kinoshita measured gasses in the air and snow that may be triggering some of the global climate change. The air is considered by many scientists to be the purest on Earth, and is therefore a good baseline to compare to air in other parts of the world.

"This is basically the background," Kinoshita said. "You remove ecosystems, you remove human influence. ... This is what everyone compares to."

Once a week he or his coworker, Jason Seifert, walked 30m across the snow and spent 15 minutes waiting in -35C to -80C weather to collect the sample. NOAA stations in Mauna Loa, Samoa, and Barrow take the same kind of samples. In Barrow the carbon dioxide levels fluctuate greatly as the ice breaks up and allows algae and plants to grow and respire. At South Pole the only real change is the slow increase in carbon dioxide, from 315 parts per million in 1957 to 372ppm last year.

"It's a pretty constant increase. It's just rising in this nice straight line over the years," he said. That increase has led to increased studies of climate change.

By the end of the winter, when the sun finally returned, Kinoshita was feeling the effects of the long winter.

"I'm experiencing things like loss of sleep, problems with memory," Kinoshita said. "I guess just feeling kind of out of touch socially a little bit, or just in general strange energy levels that weren't with me in the middle of winter."

The symptoms went away after he left the Ice in November to bike around New Zealand. He plans to return to San Diego for the holidays, and to repack. He's returning to the South Pole for another winter, and another attempt to write the thesis.

"I joke around with him," Clarke said. "He didn't get it done his first winter, so we're making him stay a second season."

After that, Kinoshita doesn't know what's next, but he figures some interesting opportunity will show up, and he'll take it, no matter how far away.

"I've developed a lot of contacts and potential people to work with in the future," he said. "No matter where I go, I think I could find a little niche to exist."