

# The Antarctic Sun

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## Helping hands



Above: Lorie Poole and Brenitta Brady top Brie wheels with nuts, pesto and cranberries. Right: Cook Luke Kearney stirs pasta while meat thaws in the other kettle. Photos by Beth Minneci.

Volunteers worked the equivalent of 72 kitchen shifts last week to help the staff prepare food for yesterday's Thanksgiving Day dinner. Nearly 900 people were expected to eat. "For us to do this nice of a dinner, volunteers are imperative," executive chef Jody Cheever said. "We're very appreciative."



Above: Mike Smith, left, and Justin Henkel pull dill leaves from the stems. The men spent six hours preparing the herb.



### Quote of the week

"I'm luscious. I want to be eaten."

- General assistant dreaming of being a strawberry.

## Vostok

# A search starts for other life

By Teri McLain  
*Special to the Sun*

On Europa, one of Jupiter's frozen moons, a thin skin of ice hides what may be a liquid sea. If so, it would be the only known place in the solar system besides Earth where water exists in significant quantities. It is there scientists believe we might discover our first aliens – a nation of microbes.

But the training ground for this interplanetary exploration is Vostok in Antarctica.

Engineers from NASA, Woods Hole Oceanographic Institution and the University of Nebraska are designing a pair of robots to penetrate the sea ice of Europa and sample the putative ocean. The cryobot, a device that melts a route through the ice, and the hydrobot, a small submarine that explores the sea below, may see real action for the first time in Earth's largest known

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# Expectations & experiences

By Jeff Inglis  
*Sun staff*

Scott Base psychologist is comparing the two

They say you only experience your first time in Antarctica once. Gary Steel wants to know how that plays out for newcomers to the Ice.

Steel, a social psychologist at Lincoln University near Christchurch, New Zealand, is studying the

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## News In BRIEF

### Swedish Polar Ambassador visits Ross Island

The New Zealand Antarctic Program played host to the Swedish polar ambassador, Eva Kettis, last week.

She had been in Hobart, Tasmania, Australia, for a meeting of the Commission for the Conservation of Antarctic Marine Living Resources and was invited to be a guest at Scott Base.

After several days on weather hold in Christchurch, Kettis arrived on the Ice for her second visit. Her first visit was to a site on the Antarctic Peninsula where a hut was built by an early Swedish Antarctic explorer, Otto Nordenskjöld, in 1901.

Sweden, which signed the Antarctic Treaty in 1984, maintains two small summer-only camps in Queen Maud Land and cooperates with Finland and Norway in areas of logistics and operations.

"We have subscribed totally to the Antarctic Treaty goals," Kettis said.

While she is the ambassador for both polar regions, Kettis said she concentrates most of her effort on the Arctic.

"That's perhaps nearer to our heart," Kettis said.

She works with the Arctic Council, a group that includes the eight countries that border the Arctic and several groups of Arctic indigenous people.

"That is quite unusual for intergovernmental cooperation," Kettis said.

The political issues, she said, are very different in the north and south polar regions. For example, since the Arctic is largely ocean, no country can make territorial claims. Research,

on the other hand, is similar in the two areas.

"The science has a clear bipolar aspect," Kettis said. "I think it has not only polar aspects but global aspects."

On her trip to the Ice, she visited Ross Island's historic huts, various field camp locations around the Ross Sea and in the Dry Valleys, and visited McMurdo, where she was particularly impressed by the *mawsonii* in the old aquarium.

"I never thought I would see a big toothfish," Kettis said.

As well, she toured Scott Base and liked what she saw.

"They are very well equipped and it works very well," Kettis said.

She was unable to leave on schedule because of the weather, which frustrated her a bit, but Kettis said she was glad to be able to see this part of "this huge and beautiful continent." ■

- by Jeff Inglis



Eva Kettis

# Roadblock on the superhighway

By Josh Landis  
*Sun staff*

McMurdo Station has hit a milestone, although it's one few people will be celebrating. Internet usage has reached its peak, and there is nowhere else to turn. The link that supplies our connectivity to the web is maxed out.

"Our internet pipeline is full," said Jim Johnson, head of information technologies. "There are nearly 700 computers on station for a population of about 900 people. That's pretty significant."

All those people surfing all those web sites are creating digital traffic jams, and some essential communications are at risk.

"Some of the critical data is not getting off continent," Johnson said. "We've hit the threshold, and we've got to change the way we do business."

That change will affect everyone who goes on-line for any reason.

Right now McMurdo gets its voice and data through a T1 satellite connection. The information (whether it's e-mail or web pages or audio files or pictures) is transmitted on a first-come, first-served basis. The T1 is a fast link, but only about half of the bandwidth is available for internet access.

Right now, larger data transfers sometimes get squeezed out by many smaller ones competing for bandwidth. The medical department has discovered an example of that limitation. The clinic has a teleradiology machine, which transmits digital X-rays to the States for additional analysis. But for the last several weeks none of the files have been able to go through because they are too large and their transmission times are too long.

To avoid this and other potential problems, a two-pronged

effort to make the system more efficient is under way.

The first step is to set up a local proxy server. That's a computer that will keep track of what web sites people visit most often, and store information from those sites locally. This will make some web-surfing faster, because each additional user won't have to download the same data individually.

But there's a catch. The less-frequented addresses will take longer to load, because that same computer will want to first store the words and pictures before it displays them on a screen.

The second step in getting a handle on the congestion will be to set up an automatic priority system that will act as a data traffic cop. This is more complicated and could take months or more to put in place. It involves "boxes" at each end of the T1 link. One will be here at McMurdo and one will be in Ames, Calif., where the line enters the information superhighway.

Each box will decide what information gets through, and when. It means the clinic's X-rays will get uploaded right away, but a person downloading music files during their lunch break may get cut off mid-transfer. Some people may have complaints about the solution, but it could be worse.

"We could have shut down non-essential sites, like National Public Radio and Napster, but we're hesitant to do that, and so is the NSF," said Johnson. "The only other option is to prioritize."

Ultimately, the internet logjam in Antarctica is a reflection of the growing reach of the technology.

"It's amazing the difference five years has made," Johnson said. "It's a different world from the days of DOS, when nobody knew about the internet." ■



**The page cannot be found**

The page you are looking for might have been removed, had its name changed, or is temporarily unavailable.

**web sites of the week**

# Seuss-a-palooza

Sites with Seuss parodies and writings

- [www.seuss.org](http://www.seuss.org)  
*The Center for Seussian Studies*
- [www.physics.purdue.edu/~northrup/old/seussshakespeare.html](http://www.physics.purdue.edu/~northrup/old/seussshakespeare.html)  
*"What if Dr. Seuss wrote Shakespeare?"*
- [www.iwaynet.net/~wstocks/fun/seuss.html](http://www.iwaynet.net/~wstocks/fun/seuss.html)  
*Links to parodies, song lyrics, early Seuss writings, analysis and links to links*

# American, Norwegian head for McMurdo on skis

Minnesota native Ann Bancroft and Norwegian Liv Arnesen started a cross-country skiing trek across Antarctica. From the side of Antarctica near Africa, on the Fimbul Ice Shelf, the women pushed off Nov. 14, aiming to reach McMurdo Station within 100 days.

This is Bancroft's second attempt to cross the continent. In 1993, Bancroft, McMurdo Station resident Anne Dal Vera and two other women stopped at the South Pole after 67 days of traveling, 882 miles from their goal.

They missed their mark, but still made history as the first team of women to reach the South Pole on skis.

Dal Vera is playing for the public a documentary made about their attempt Monday at the galley. The film, "Poles Apart," features Bancroft, who was the first woman to reach the North Pole by land, Dal Vera and the rest of the team dubbed the American Women's Antarctic Expedition.

Bancroft and Arnesen's start was originally planned for Nov. 1, but they were held up in South Africa when bad weather in Antarctica made flying to their jump-off point impossible. They hope to reach the South Pole by Christmas.

Dal Vera is from Colorado. She works in waste management and is in her fifth season with the U.S. Antarctic Program. ■



## The Sun's Annual creative writing festival

*Monday morning on the Ice Runway. It's always a little slow out here after Sunday's relaxation, but the weather's clear and we're loading planes. Me? I'm just sitting out here, watching the action, wasting time before I get to start my day's work.*

*The past week has been pretty crazy. The holiday season is beginning, and the weather's been wild for months now. My partner, Pat, and I are still planning to head over to Castle Rock when we get a chance.*

*Looking out the window of the big red van I'm in, I see a flurry of activity over on the cargo line, and the fuelies are walking around near their shed, waiting for the first pit stop of the day. A big dozer stops on the apron, and the driver hops out for a smoke. The firefighters are heading onto the runway to clear away a couple of penguins who have set up camp in the middle.*

*But there's something different about today. **Finish this story or submit your own.***

### SELECTED STORIES WILL BE PRINTED IN THE SUN

**Poetry** (Maximum length 30 lines.)

**Fiction** (Maximum length 500 words.)

**Finish this story...** (Maximum length 500 words.)

Entry deadline: 6 p.m. Dec. 17

Enter via e-mail to [AntSun@polar.org](mailto:AntSun@polar.org), or at the Sun office in McMurdo's Building 155.

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**Web address:** [www.polar.org/antsun](http://www.polar.org/antsun)

## the week in weather

### around Antarctica

**McMurdo Station**

High: 28F/2C  
Low: 6F/14C  
Windchill: -31F/35C  
Wind: 46 mph/74 kph

**Palmer Station (Saturday)**

High: 43F/6C  
Low: 25F/-4C  
Avg. temp: 30F/-1C  
Wind: 44 mph/70 kph

**South Pole Station**

High: -13F/-25C  
Low: -31F/-35C  
Avg. temp: -23F/-31C  
Wind: 29 mph/47 kph

### around the world

Saturday's numbers

**Chennai (Madras), India**

High: 86F/30C  
Low: 73F/23C

**Scarborough, Maine**

High: 38F/3C  
Low: 26F/-3C

**San Francisco**

High: 62F/17C  
Low: 48F/9C

**Columbia, Missouri**

High: 49F/9C  
Low: 34F/1C

# Expectations from page 1

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relationship between people's expectations about Antarctica and their actual experiences.

The project, supported by Antarctica New Zealand and operating at Scott Base, involves talking to about 20 people at the base about their perceptions of life in Antarctica and their predictions about what their perceptions will be like in the future.

This project began in October and will continue with interviews at the end of the summer and, for winter staff, at Winfly and next October as well.

Steel is reluctant to say much about the current project, because it is still in progress and he doesn't want to influence the study group. He is looking at similarities and differences between expectations and experiences and why they may either be accurate or inaccurate

for his studies, to keep research information separate from his contract work.

In the past, he has studied other aspects of life on the Ice. What he had often heard from the public was that they thought the weather would be the hardest part of living and working in high latitudes. But, he said, that's not the case.

"What we find is that it's the social environment, not the physical environment," Steel said. "Life is life, even in the Antarctic."

One of those studies looked at the patterns of moods over the course of a stay on the Ice. He had heard anecdotally and from other researchers that at the halfway point of a person's work on the Ice, the mood drops to its low point.

"We went looking for that," Steel said.

What he found was that there was some evidence of what he called the "third quarter phenomenon."

"Some people do show that pattern," Steel said, "but it's not a particularly reliable effect."

And mood "drops" aren't people sinking into depression.

"They come down from being basically ecstatic to mellow," Steel said.

He also looked at whether there is a type of person who is well-suited to working in the Arctic or Antarctic.

"Is there a polar personality? There seemed to be," Steel said.

He was part of a 14-country collaboration studying 450 cases. The results showed that there is a tendency for polar workers to have lower neuroticism, higher extroversion, higher openness to experience, higher agreeableness and higher conscientiousness than is the norm among the U.S. population.

Steel expected to find more openness to experience. The hiring process weeds out certain types of people.

"They were selected for their conscientiousness," Steel said.

The rest of the characteristics, though, were unknowns. People who have the set of traits in a "polar personality," Steel said, tend to be more stress-resistant and more emotionally stable than the general population. He said those attributes are very useful for working in extreme environments.

In general he said, people have positive experiences and look back fondly on their time on the Ice after they leave.

"People tend to do very well down there," Steel said. ■

## The social, not physical environment affects people's moods more. "Life is life, even in the Antarctic."

- Gary Steel, psychologist

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rate for different people.

"I'm not sure what we're going to find," Steel said. "We suspect that there's a connection between the quality of a person's experience and the match, or mismatch, of expectations and actual perceptions."

He did say, though, that some people are accurate and realistic about their expectations, while others are not. Some of that information comes from friends or colleagues who have been to Antarctica before.

"It's New Zealand. Everybody knows somebody who's been down there," Steel said.

He said the results, when the study is completed in a year, could be used to prepare first-time Antarctic workers, to help them better understand what they're getting into.

Steel is an appropriate person to help polar workers have more realistic expectations. He is a psychologist interested in people in extreme and unusual environments. In addition to the Antarctic, he has studied people working in the Arctic and on submarines, spacecraft and isolated oil rigs.

Separate from his research, he is also a psychological contractor for Antarctica New Zealand. He has research assistants or colleagues con-

## Vostok from page 1

subglacial body of water: Lake Vostok.

Just one of almost 80 known lakes beneath Antarctic ice sheets, Lake Vostok has recently captured the attention of glaciologists and microbiologists alike. A pristine body of water cut off from the outside world for a million years or more, the lake has the potential for supporting previously undiscovered microbial life forms, as well as holding clues to ancient climates. It is a time capsule of sorts, buried under four kilometers of ice.

When the Russians opened Vostok Station near the geomagnetic pole in 1957, they had no idea that it was situated over an ancient body of water more than 1,640 feet (500 m) deep and 243 miles (230 km) long. And when they started drilling the world's deepest ice core in an attempt to understand recent global warming in relation to the climactic cycles of the last 500,000 years, they would not have predicted that they would be stopped at 11,886 feet (3,623 m) by a group of scientists concerned with contamination of the lake's pure water.

This season, the National Science Foundation is setting up a camp near the Russian station to explore subsurface features of the lake.

Although early seismic surveys in the 1960's and 70's indicated that water might exist under the ice cap, it wasn't until drilling was well under way in the early 1990s that satellite, seismic, and airborne radar data were put together to map the buried lake. "It was a 'Eureka!' moment," said Martin Seigert, a University of Bristol glaciologist.

In 1995, the Scientific Committee on Antarctic Research recommended that drilling be stopped 400 feet from the lake's surface, until a sterile method could be found to tap into one of the oldest ecosystems on earth. Last year, microbiologist



Russian driller Valery Shoshkin displays the ice core room at Vostok Station last January. More than two miles' worth of cores were pulled from the ice beneath the station. Photo by Josh Landis.

John Priscu of Montana State University examined bits of ice from the deepest part of the core and found bacteria.

It is still unclear whether these microbes were deposited by ancient winds, or if they are indicative of bacteria living in the lake below. But it is tantalizing to astrobiologists, who speculate that if life can exist in Lake Vostok, it may also be present on Europa.

A multinational team of scientists and funding agencies is assembling to devise a method for drilling into Lake Vostok without contaminating it with drilling fluids or foreign bacteria. The first step will commence this week with test flights of the SOAR Twin Otter. Equipped with instruments for an aerogeophysical survey, the team plans to conduct 69 flights this season and produce a data set that will aid sci-

entists in understanding the lake's physical properties and geologic origins.

The next phase could involve NASA tests of the robots. The cryobot would melt its way down to the lake where it would eject the hydrobot to explore the depths and send back pictures and data to the surface via a cable. The final stage would involve deep coring to retrieve sediment and water samples. The details of probing the lake without introducing contaminants are still being worked out.

It is a complex and ambitious effort that with the help of NASA technology will potentially answer some fundamental questions about the evolution of life here on Earth. And by giving scientists a testing ground for the cryobot and the hydrobot, something may someday be discovered about the evolution of life on other planets. ■

## Highway 1 **one**

### What has been your biggest psychological challenge this season?



**"My job. It drives me crazy."**  
Jason Raver  
Materials person for dining facility



**"Having to 'hurry up and wait' when the weather cancels flights."**  
Lt. Col. Dan Dunbar  
Operation Deep Freeze Chief of Staff



**"Dealing with the constant social stimuli."**  
Sheri "Peaches" Bluestein  
dining facility attendant



**"Very little darkness in 13 years."**  
Todd Franson  
heavy shop worker



**McMurdo Station is close  
to a record November**

**Why** snowfall  
& what's it mean for us?

By Beth Minneci  
*Sun staff*

Fleet operator Rowdy Branson pushes snow on the ice runway. Photo by Beth Minneci.

By now, the hills ought to be chocolate brown, the color of volcanic rock that lies under the snow. During a typical November, the temperature should be mild by Antarctic measures. The sky should be a deep shade of blue.

Not this November.

After nearly record snowfall – 15.6 inches counted on Friday – the ground is still solid and white. Yesterday, 18 of 25 November days had been cloudy. And the temperature, typically in the upper 20s and lower 30s, has been mostly in the lower to mid-20s.

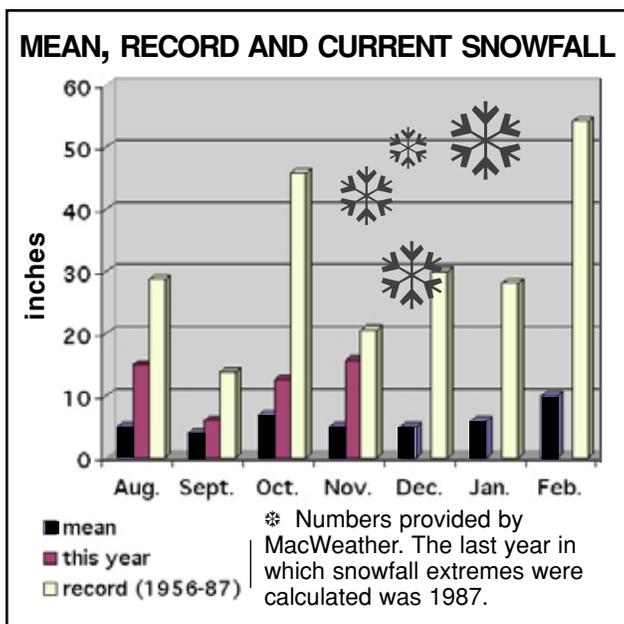
MacWeather forecasters say a stormy weather pattern typical of Winfly in August never left town. And they don't know why.

"We have no clue," MacWeather lead forecaster Joe Kramer said. But

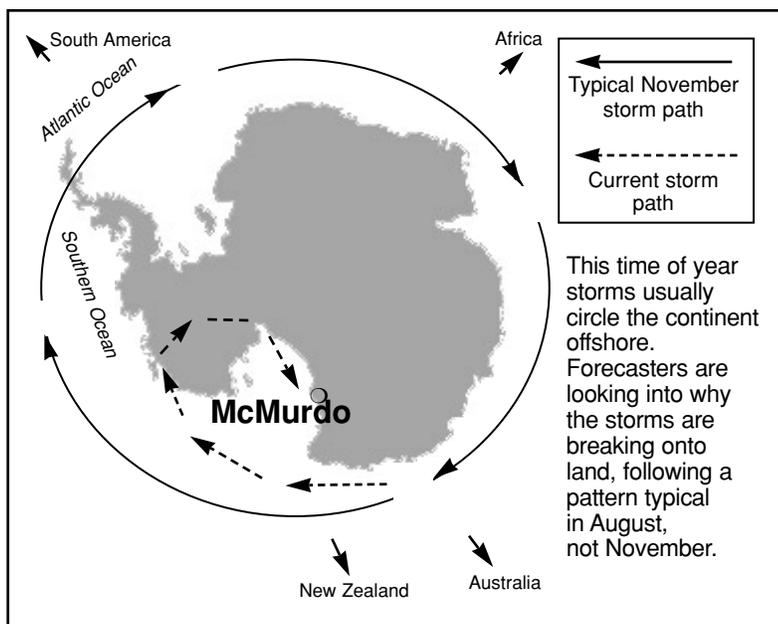
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MacWeather's lead forecaster Joe Kramer monitors screens showing weather predictions and current weather pictures. Photo by Beth Minneci.



Graphics by Beth Minneci



from previous page

they're studying charts and graphs, trying to figure it out.

The fluffy white stuff that piled up outside office windows this month was a nice reminder of wintertime back home.

But on the airfield, normally a bustling time for cargo and passenger transportation, the only sure actions were bulldozers moving snow and fuel workers scrambling to protect their lines.

Williams Field on the ice shelf is scheduled to open next month, and the sea ice runway is scheduled to close. But the sea ice runway is valuable until then because larger planes with wheels, which can carry more weight, can land there.

November is typically a good month for flying, but not this November.

Many scientists didn't get to the South Pole and field camps. Cargo pallets stayed stacked on the ice. Thousands of pounds of fresh food for Thanksgiving Day dinner arrived later than scheduled.

Most Novembers, fuel operations foreman Scott Taube and his crew deal with wind-made snow drifts, but the large amount of snowfall this month compounded the fuel staff's work.

Likewise for fleet operators.

Too much snow on the ice not only impedes airplane traffic, it traps heat, which deteriorates the sea ice that station operations manager Bill Haals said everyone would like to preserve. A thin layer of snow, however, reflects sun off the ice.

Drivers moved an overwhelming amount of snow with a tractor fleet that includes some rickety pieces of equipment. They pushed heavy snow off the airstrip and the ice runway road, then went back to spread a thin layer.

**“The weather patterns here are unlike anything we’ve ever seen anywhere else.”**

*- Joe Kramer, MacWeather*

Fuelies had to keep their lines clear so that they could reach the valves. On severe weather days, fuel operators fill the 500-gallon runway generators every other day to keep the power running in about two dozen huts out there.

With a mean November snowfall of 5 inches, snowfall is not usually a big problem. This November, though, fuelies were in snow-mode sometimes three or four days a week.

“It’s had a big impact on us,” Taube said.

On a global scale, the weather’s been weird for about the last decade. People have become accustomed to witnessing extreme weather events – record temperatures, heat waves, rainfall and drought.

Back at MacWeather’s offices, forecasters are monitoring what’s happening this month and they’re scratching their heads. They can see the storm pattern: Storms that normally circle the continent offshore

are breaking on to land, over to McMurdo. It’s a pattern typical of August that has continued into November. But they don’t know why it’s happening.

At home, detailed meteorological records go back about a century. Here, MacWeather’s numbers date back to 1956, and for the most part are not compiled to reveal any meaningful patterns.

Earlier this month, different MacWeather forecasters reported different snow inch counts. But Friday, they agreed McMurdo Station was 5 inches short of the 1971 November record of 20.6 inches. More snow fell Saturday.

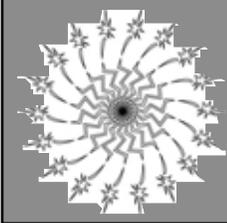
The unusual weather keeps the jobs in and out of the office interesting.

“The weather patterns here are unlike anything we’ve ever seen anywhere else,” Kramer said. “They’re hard to predict. They change very rapidly.” ■

# our Antarctic week

**27 Monday**

"Poles Apart,"  
documentary video  
introduced by  
Anne Dal Vera,  
8 p.m., galley



**28 Tuesday**

Game Night,  
8 p.m., Scott  
Base. Sign up  
with the recreation  
department.

**29 Wednesday**

Science lecture:  
"Measurements of  
crustal motion in  
southern Victoria Land,"  
by Mike Willis, U.S.  
Geological Survey, 7:30  
p.m., Cray library

**30 Thursday**

Book exchange, 8  
p.m., Coffee House.  
Sign up on the board  
in front of the  
recreation department.  
See recreation for  
more information.

**1 Friday**

Swing Gala,  
7:30 p.m.,  
gym

## SEUSS-A- PALOOZA

7 p.m. Dec. 3 at the Coffee House  
Readings, recitations, songs and skits  
of or inspired by the writings of Dr. Seuss.

OW. MY EYE!



## COLD HARD FACTS

**(Saturday's Thanksgiving Day dinner)**

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**Number of guests:** 880  
**Pounds of meat:** turkey 1,300; ham 150; Antarctic cod 200; salmon 40  
**Gallons of gravy:** 20  
**Desserts:** pies 150; pecan tarts 500  
**Number of rolls:** 3,000  
**Pans of stuffing:** 24  
**Pounds of fresh fruit:** 120  
**Pounds of fried onions:** 24  
**Pounds of canned cranberry sauce:** 200  
**Pounds of cheese:** 60

### Ross Island Chronicles

By Chico

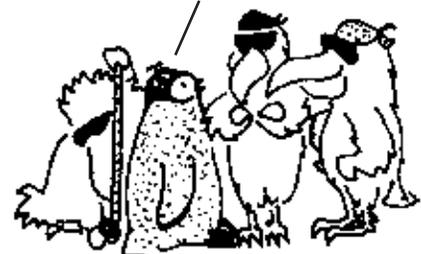
Hey Dad,  
can I go out  
and play?



It's Thanksgiving Day.  
Why don't you go and find  
someone who hasn't eaten,  
and brighten their day?



Hi. I'm here to  
invite the miserable  
and wretched to  
join me this  
Thanksgiving Day.



Looks like we have  
a guest for dinner,  
boys.



We can't eat him.  
He's done wet all  
over himself!

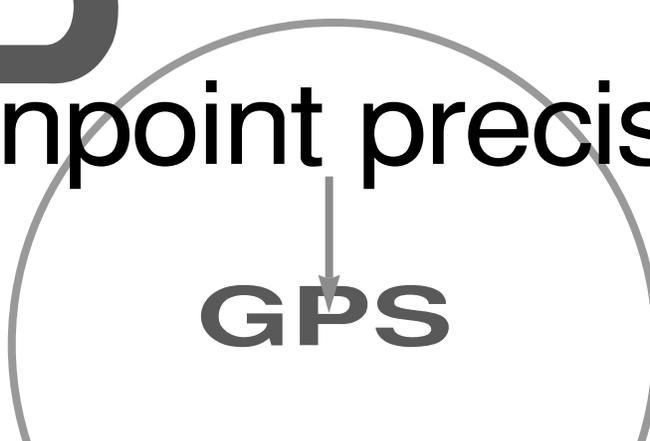


If you're going to  
play against the big  
boys, it's always  
smart to have a  
backup plan in case  
you want out.



Chico

# P inpoint precision



GPS

**geographic locators are accurate  
to within tenths of an inch**

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By Jeff Inglis  
*Sun staff*

Several scientists in the U.S. Antarctic Program use specific measurements and locations on the surface of the Earth as key elements in their research. They watch many processes, including the movement of glaciers, growth or shrink rates of ice sheets and rock layers and the melting of patches of snow in the Dry Valleys.

These researchers use the Global Positioning System, originally created for combat use by the U.S. Defense Department, to locate themselves and their study areas very specifically. At McMurdo Station each summer are GPS experts who provide equipment and training for about 20 science groups on the continent.

"We're supporting grantees who are using GPS for their field research," said project leader Bjorn Johns, of the University NAVSTAR Consortium (UNAVCO), a group of 100 academic institutions, including the National Science Foundation, promoting the use of high-accuracy GPS for scientific research.

Many people on the Ice and in the U.S. have their own handheld GPS units, which cost around \$200.

"It's become a national utility," Johns said.

Commercial handhelds provide accuracy to within about fifteen feet of an actual location, Johns said.

By contrast, the equipment Johns and his colleague Chuck Kurnik issue are accurate to within tenths of an inch, cost around \$15,000 and involve a platter-size antenna and laptop computer-size receiving box.

GPS is based on a group of satellites orbiting Earth and several ground stations monitoring them. The satellites broadcast their position in space and the exact time from an on-board atomic

clock. By receiving the signals from several satellites, a GPS unit on the ground can calculate its location.

But that can be difficult at high latitudes because the satellites don't pass directly overhead, which would give the best possible readings.

"They're all low on the horizon in the polar regions," Johns said.

All of the positions calculated are relative to other, fixed, known locations. To be precise, measurements need to be compared very carefully with the exact trajectories of the satellites at the time of the reading.

"That typically means collecting and post-processing data," Johns said. That process can take a couple of days, he said.

Some groups need Johns and Kurnik to do GPS portion of their work, while other researchers need technical assistance or data-processing help.

Johns and Kurnik also install both permanent and temporary stationary GPS stations to monitor ongoing geologic processes and to improve accuracy of nearby readings.

This season, they put a station on Mount Erebus to watch how underground activity changes the volcano's surface.

"If there's any inflation or deflation of the volcano relative to McMurdo we'll see that," Johns said.

If anything significant happened on Erebus, or anywhere else with a permanent GPS monitoring station, the data would be valuable for scientists.

"When an event occurs, you've captured it, with pre- and post-event data," Johns said.

Another important element is fixing the exact antenna position to the ground. If a measurement is accurate within frac-

tions of an inch, a human error in antenna placement for observation could appear to be a large fluctuation in surface movement.

To provide a stable platform, Johns and Kurnik sink a metal rod into the rock or ice and affix a leveling platform to the rod. The antenna screws onto the platform. Each reading, then, is taken from the same location relative to the rod.

If a location change is measured, it means the rod has moved, and therefore the rock or ice surrounding the rod has moved.

This type of measurement is possible around the world using base stations and satellite readings anywhere on the surface of the Earth. But Johns said Antarctica is where GPS gets used most heavily. He and Kurnik may support five science projects during the rest of the year, and more than 20 during the summer field season on the Ice.

The GPS work helps influence future research, Johns said. This season at Icestream C, a group wanted to drill an ice core in an area where the glacier isn't moving very quickly. Because of GPS surveying last year, they knew where one was.

GPS is also used to map the atmosphere. Since GPS uses radio waves, which behave differently as atmospheric conditions change, GPS readings at known locations can show variations in the ionosphere and troposphere through changes in radio waves along different paths.

Johns and Kurnik don't directly interact with the atmospheric mapping projects, which are not based in Antarctica, but help people use GPS in all kinds of ways.

"Everyone has something they want measured," Johns said. ■

# VICTORY AT VIDA



By Josh Landis  
*Sun staff*

Kirsten Wade, bottom right, was part of the team that went to Lake Vida last week to find out what became of a decades-old, diesel-filled bore hole. Drillers, background, set up their rig. Photo by Bill Gilmore.

**F**or decades a mystery hid beneath the sands of Victoria Valley. A hole one thousand feet deep, full of diesel fuel, was concealed. It had been drilled in the early 1970s, but attempts to locate it again in the 1990s proved unsuccessful. Hundreds of gallons of fuel were out there somewhere, but nobody could say exactly where.

Until now.

The U.S. Antarctic Program's remediation team and three New Zealand drillers returned to the scene last week to resolve a puzzle that started decades ago.

The Dry Valley Drilling Project took place between 1973 and 1975. It was an international effort to explore the geology of the region and better understand how the rare valleys had formed. American, New Zealand and Japanese research programs collaborated and drilled numerous sites throughout the Dry Valleys and McMurdo Station.

One of the holes went in near Lake Vida in Victoria Valley.

In order to keep the hole from collapsing, it was filled with diesel fuel. This would allow scientists to monitor temperatures at different depths. It was assumed since the hole was drilled in bedrock, the fuel would simply remain where it was. A short length of pipe was pushed into the ground to keep the "active zone" on the surface (which freezes and thaws) from melting into the hole.

Sometime during the next two decades, however, the hole fell into disuse and the section of pipe was wrenched out of place. According to Joyce Jatko, National Science Foundation environmental officer, it was most likely the result of Vida's level rising and falling over the years. The ice on the lake's surface probably pushed and pulled the piece of metal out of place.

What brought the old hole to the NSF's attention again was a team of scientists that wanted to use it to take new temperature readings. They found the pipe, but couldn't find the shaft, and the search began.

"The cap of the borehole was not attached to any casing and was not even sitting on top of the borehole," said Jatko.

Furthermore, there was an odor of diesel fuel in the area. It appeared that some fuel in the ground had leaked.

But how much? And where had it gone?

There were a number of unpleasant possibilities, the worst of which would have been that the fuel was somehow released into Lake Vida when the lake's level rose above the standpipe in the mid-1990s.

Fortunately, after the remediation team's recent visit to the site, it doesn't appear that was what happened. They were able to dig around and find the original hole. They also discovered something very relieving: In 27 years, the thousand-foot (305 meters) column of fuel had dropped less than a foot (30 centimeters).

"We were like, 'Oh my god, we've got

it!'" said environmental engineer Bill Gilmore, describing the moment.

If only a foot of fuel is missing, it means cleanup will be much easier than expected. Gilmore said initial core samples taken near the drill site last week indicate that the fuel that managed to escape from the top of the hole penetrated no more than 6 inches (15 cm) deep.

"This project went way beyond our expectations," said Gilmore.

Still, there is additional testing that needs to be done to make sure the extent of the diesel plume is known. Any residual fuel would affect the purity of the area indefinitely.

The remediation team is also faced with the decision of what to do with the hole now that they've found it.

"We're looking at a couple of different options," said Gilmore. "But we're definitely going to monitor it."

Options include draining the old fuel, replacing it with water (which would stabilize the hole and close it for good), or even leaving it as is so scientists can continue to research the bedrock beneath the valley.

"It's good to know work that was done in the 70's is still of value today," said Jatko. "And it's a remediation project that had a very happy ending. We found (the hole), it was in much better shape than we expected, and we don't have a serious contamination problem." ■

# Modern plane and old history-maker

## ARE BIRDS OF A FEATHER

By Josh Landis

*Sun staff*

Last Sunday evening a piece of history landed on the sea ice runway. Appearing to float slowly out of the sky and land gently on the white surface, the Basler BT-67 joined the air fleet operating out of McMurdo Station.

Built on the airframe of an old Douglas DC-3, the Basler will be here for about a month to fly missions with weight requirements that fall between the smaller Twin Otters and the larger LC-130s.

**“It will be an evolving process to see how it fits in the U.S. Antarctic Program.”**

*- Alana Jones,  
fixed-wing coordinator*

“It’s a nice addition to the other platforms we have,” said Alana Jones, fixed-wing coordinator. “It will be an evolving process to see how it fits in to the U.S. Antarctic Program.”

The Basler is a not-so-distant relative of the historic aircraft, *Que Sera Sera*. In 1956 that Navy R4D carried Adm. George Dufek south to become the first person to stand at the Pole since Robert Scott’s party in 1912.

Throughout the years, the Navy flew countless missions in R4Ds and other similar aircraft as part of Operation Deep Freeze.

The last time a plane like the Basler flew for the program was in 1968. The Antarctic Journal documented the day.

*“Re-supply of the inland stations went well, and on December 3, fuel deliveries were reported to be slightly ahead of schedule. At Hallett Station, where landings are made on the sea ice of Moubray Bay, rising temperatures caused the runway to deteriorate, so it was closed to traffic on Dec. 3.*

*“The day before the closing, an LC-117D made a round-trip supply flight between McMurdo and Hallett Stations that was routine in all respects except*



Top: The Basler BT-67 landing on the sea ice runway at McMurdo last week. Photo by Josh Landis.

Bottom: Gus Shinn examines the jet-assisted takeoff rockets on the *Que Sera Sera* at the National Museum of Naval Aviation in Pensacola, Fla., earlier this year. Photo by Jim O’Connell.

*one. It was the last flight over the Antarctic by a United States DC-3-type aircraft....*

*“These veterans of Antarctic flying are being dismantled and prepared for return home by ship, thus ending a saga that goes back to January 29, 1947, when a C-47 with Admiral Byrd on board flew from the aircraft carrier Philippine Sea to Little America IV, on the shore of the Bay of Whales. It was the first aircraft in Antarctica to be equipped with a combination ski-wheel landing gear, and at that time it was the largest plane to have reached the continent.”*

Retired Navy Chief Radioman

Billy-Ace Baker spent multiple winters and summers on the Ice between 1963 and 1980. He’s now an avid historian and chronicler of Antarctic achievement.

“It is not known how many Douglas DC-3s remain entombed in the Antarctic, but only one ever claimed the lives of men,” said Baker. “The versatile aircraft was immortalized on the continent by having three geographic locations named after it: Dakota Pass, R4D Nunatak, and Skytrain Rise,” Baker said. ■

*Brian Stone contributed to this report.*



# Profile



Jack Hawkins

## A PILOT WHO Flies fickle skies

By Beth Minneci  
*Sun staff*

From a helicopter hangar near the sea ice, the distant mountain peaks look dark blue, almost purple. Strong gusts blow snow in the distance and on the sea ice runway, making everything in sight look blurry.

The day is, in pilot speak, marginal.

On the radio, Jack Hawkins is talking with a pilot at Marble Point, a sort of helicopter rest stop near the Dry Valleys. The men are discussing whether it is safe for the pilot to bring home people he left to work in the Valleys this morning.

If the conditions get worse soon, the pilot will leave them, and they will camp. The pilot will stay put at the stop-over at Marble Point.

"They have survival bags but we don't want to leave them out there with survival bags if we can help it," Hawkins said of the people waiting to be picked up.

From the window of his office in the hangar, Hawkins can see the gray tails of LC-130s on the airfield sticking out of the airborne snow.

"I've got a good view of what's happening with the weather," Hawkins said. But still, sometimes a pilot can't tell how bad flying conditions are until the pilot is in the air.

Earlier in the day, two pilots tried to reach a remote camp about 150 miles south. Visibility was OK, but the turbulence in the mountains was too much. The helicopters turned back.

"The weather was good at the camp, but they would have had to go through some pretty rough territory," Hawkins said.

Several other trips were canceled. Hawkins was scheduled to take cargo to a camp on Mt. Erebus, but low clouds kept him on the ground.

Two New Zealand pilots turned back after they saw bad weather on the other side of Hut Point, only a couple of miles from Scott Base.

Not all days are like this, of course. When the weather is good, Antarctica is a fabulous place to be a helicopter pilot. The job, after all, entails shuttling cargo and scientists to some of

the most remote and majestic places on Earth.

"It's some of the best helicopter flying in the world," Hawkins said. "One day you might be up 13,000 feet going to Erebus. Next you might be on the sea ice helping a scientist capture penguins. Then, you're at the Dry Valleys and lakes."

Back in the states, for years Hawkins flew over the Gulf of Mexico, bringing people and equipment to drilling sites. On the Gulf, the ocean storms are fierce and mercurial.

"A lot of people think flying in the mountains is a lot harder than the Gulf," he said. "The Gulf, day in and day out, is actually pretty tough."

In his fifth Antarctic season, Hawkins, 54, started a helicopter flying career in 1967 with the U.S. Army. He served in Vietnam in 1968 and 1969, where he first flew in mountains.

After that, the Texas native went home to earn a bachelor's degree in forestry before Petroleum Helicopters Inc., hired him in 1973.

He's been with PHI ever since.

Many McMurdoites can boast of traveling the world, but not many have lived in foreign countries while earning a salary. Hawkins and six other pilots here work for PHI, a Louisiana-based company that stations pilots all over the globe.

In Africa, Venezuela and Argentina, Hawkins flew people and equipment to and from work sites.

During a typical year, he spends about half of it away from his wife, Ann, a teacher, and two grown sons, but the rest of the year he is working near home.

During college, Hawkins hoped to combine forestry with flying, but the closest he's come was in 1989 with Alaska wildlife and fisheries employees he flew around the Prince William Sound after the Exxon Valdez spill.

"That was fun," he said, adding that he was intrigued by the state's efforts to assess the environmental health of the area, and with the kodiak bear, elk, salmon and trout. "Everywhere I went I took my rod and reel."

Here in Antarctica, Hawkins is the only



Hawkins takes off with a double slingload from the helo pad near the sea ice. Photo courtesy of Jack Hawkins.

one of seven pilots who is a military veteran but not retired military. Collectively, the pilots have 173 years of flying experience.

Each morning, helicopter coordinator Rhonda Rodriguez hands out a flight schedule. But the schedule is flexible because flights can be canceled at the last minute and shuffled and rescheduled when the conditions change.

"We're always on our toes," Hawkins said.

The pilots take cargo and passengers to field camps. The passengers are usually scientists who may work in the field for months. Or they might be there for an hour or two to check data on instruments already set up.

One pilot can take people out, then fly off to another destination, and another might pick them up after completing a drop-off somewhere else.

The majority of passengers are at ease on a helicopter, Hawkins said. But for those who aren't, pilots emphasize the safety features of the aircraft to calm them down.

"The attitude of the pilot and a professional manner can lay down a lot of apprehension," he said.

And nobody has ever argued with him about canceling a flight for bad weather.

"Even though they want real bad to do their work, if you don't want to go, the scientists don't want to go because they want to be safe."

When asked if he's had close calls in a helicopter, Hawkins said, "Anybody who's been flying for this long has been in scary situations.

"You deal with them and you go on. You learn from them. The biggest thing is to avoid them. One way is by turning back." ■