The Antarctic Sun

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Road ends at the Pole

ITASE starts slow, ends well

By Mark Sabbatini
Sun staff

Their road trip to the South Pole took longer than expected, but in the end that also helped them gather more data and pick up tips for the future.

Deep snow and deceptively tough hills slowed the U.S. component of the International Trans-Antarctic Scientific Expedition (ITASE) during the final season of a four-year mission. But participants used a two-week delay at the start to collect more information at base camp and tacked on an extra journey at the end to get a feel for the area they may traverse next.

"Of the 100 percent we planned to do…we did 120 percent," said Paul Mayewski, the U.S. ITASE field leader.

This season's 15-member U.S. team is part of a 19-nation effort to provide an in-depth portrait of Antarctica's climate, ice accumulation and atmospheric conditions for the past 200 years. The U.S. trip from Byrd Surface Camp to the South Pole came after three years of collecting data during trips on the West Antarctic Ice Sheet.

This year's traverse got off to a rough start Nov. 24 as the two "trains" of scientific vehicles, each pulled by a large agricultural tractor, immediately stalled in deep snow and traveled only 25 miles (40 km.) in two days. Team members were planning to make the 775-mile (1,240 km.) trip in 40 to 50 days, including stops of several days at five sites to collect scientific samples.

"Within 48 hours we realized we weren't going to make it," Mayewski said during a press conference conducted by telephone at 3

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Photo by Kristan Hutchison/The Antarctic Sun

Joe Mastroianni chips ice from the frozen surface of Lake Bonney. The ice chips are collected in buckets and melted down for water.

Finding water in a desert

"Water, water everywhere, nor any drop to drink..."

— Coleridge, *The Rime of the Ancient Mariner*

By Kristan Hutchison
Sun staff

In Antarctica, a person could easily die of dehydration surrounded by fresh water.

The problem, of course, is it's all frozen.

Considered a desert because of its lack of precipitation, Antarctica actually contains 90 percent of the world's fresh water in its ice. But Antarctic stations and camps must go to great lengths to produce something suitable for drinking, cooking, washing and research.

If the South Pole has a power outage, no matter how brief, the water team springs into action, opening valves to empty the pipes before they freeze and burst. The only reason the pipes don't regularly freeze in the constant sub-zero temperatures is that they are all warmed by heat tape, surrounded by at least two inches of insulation, and the water in the pipes continually circulates.

The water in the pipes comes from a unique "well," called a Rodriguez well or more commonly a "Rod well," which melts the ice by squirting 80F-(26C)degree water down a hole.

"It's as pure as it gets," said Scott Smith, the construction coordinator in

See Water on page 11

Quote of the Week

"Adventure only happens when someone makes a mistake."

- Old Antarctic explorer telling tales

Ross Island Chronicles By Chico

Cold, hard facts

Bergs vs. breakers

Number of icebreakers in the U.S. Coast Guard fleet: **4, but one never leaves the Great Lakes.**

Number of sizeable icebergs in the Ross Sea: **3**

Length of the icebreakers coming to Ross Sea this season: ***Polar Sea* – 399 feet (120 m), *Healy* – 420 feet (126 m)**

Length of the icebergs: **C16 – 30 miles (48 km), B15 – 100 miles (160 km), C19 – 125 miles (200 km)**

Power of icebreakers: ***Polar Sea* 75,000 horsepower, *Healy* 30,000 hp**

Thickness of ice the breakers can ram through: ***Polar Sea* 21 ft (6.3 m), *Healy* 8 ft (2.44 m)**

Estimated thickness of the icebergs: **B15 — 950 ft (290 m), C19 – 950 ft (290 m)**

Which would win in a head-on collision: **icebergs**

Sources: U.S. Coast Guard, National Ice Center, Kelly Brunt

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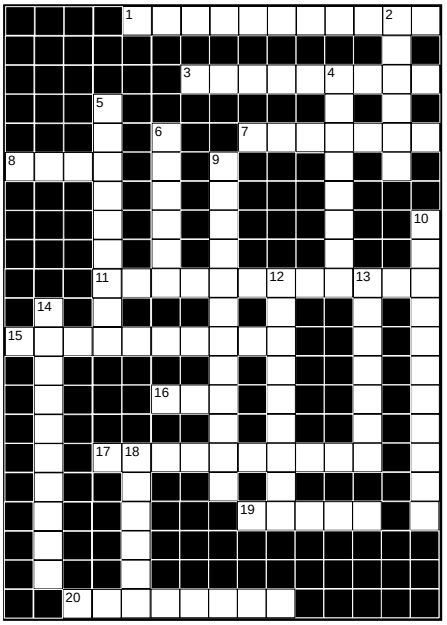
Web address: www.polar.org/antsun

Katabatic Krosswords: Your ship has come in

Across
1. The Calif. port where the cargo ship departs
3. Where half of last year's cargo was sent
7. The process of getting supplies off the ship
8. Comes after icebreaker and cargo vessels this year, a reversal of the norm
10. Volunteers who pull in ropes and help dock ships
11. Needs to be carved out so ships can dock
15. Stuff being sent back to the U.S.
16. A.k.a. cutting a path through the ice
17. The first type of ship to arrive
19. The second icebreaker being deployed this year
20. These make it tough for ships to get through

Down
2. What stuff is stored in for shipping
4. The first icebreaker to McMurdo this year
5. In drydock this year, hence a different icebreaker
6. Research vessel visiting McMurdo this year
9. The new cargo ship
12. The old cargo ship, which ended its run last year
13. Two of these leaders this year on new cargo ship
14. One way to go ashore without docking
18. Lots of these at Palmer, almost none at McMurdo

Solution on page 8



Squares too small? No pencil to erase your mistakes? Try our interactive online puzzle at www.polar.org/antsun

Collecting mail from Antarctica

By Mark Sabbatini
Sun staff

Mail a bill from Seattle and collectors leave you alone. Mail it from Antarctica and collectors of a different sort consider you a hot item.

A postmark from the Ice can turn anything from the writings of historic explorers to a blank envelope into something sought by thousands of people. For many it's simply fun to collect Antarctic stamps, mailings and similar items, but some say their hobby is also making a vital contribution to history.

About 5,000 pieces of mail were sent to Amundsen-Scott South Pole Station last summer by people wanting nothing more than a South Pole postmark on the return envelope enclosed inside, wrote Scott Smith, a plumber who handles the requests. Thousands more requests are sent to other stations. Groups meet online and in person around the world to compare collections, and businesses thrive selling commemorative stamps and arranging for people to receive mailings from Antarctica.

"This is their piece of Antarctica," Smith wrote in an e-mail. "These folks aren't lucky enough to get here. So this is the next best thing."

Collecting stamps and postage-related items – known as philately – is hardly a new interest when it comes to Antarctica. Stamps commemorating expeditions have been issued since at least the Heroic Era in the early 1900s. The U.S. has had postal service in Antarctica since 1928 and there were nearly 250,000 requests for South Pole postmarks in 1956 when the government was encouraging such requests instead of imposing limits currently in place.

Smith, a stamp collector since he was "8 or 9 years old," said his focus is U.S. Antarctic Program envelopes dating back to the 1920s. His rarest envelope is one of about 25 known worldwide bearing cancellation marks by Finn Ronne, leader of a private 1940s expedition, which have sold for up to $2,500.

Ronne, according to Smith, was made an unknown and unpublished postmaster by the U.S. government to counter the British occupation and postal presence at Stonington Island. It's a relatively obscure bit of Antarctic history, but for collectors like Smith it's also one of the primary attractions.

"Besides being a collecting area, it is also a great amount of history," Smith wrote. "The more you collect an area, the more you want to know about what you have in your albums. This then makes you buy books and more books about the area you are collecting."

Gary Pierson, a Las Vegas resident, said his longtime interest in philately has resulted in an extensive collection of documents about people and moments in Antarctica that might otherwise be largely forgotten. His Web site, www.south-pole.com, features materials ranging from a letter addressed to Capt. Nathaniel B. Palmer during an early 19th century ship voyage to a full range of documents from the 4,700-member Operation Highjump led by Adm. Richard Byrd in 1948, the largest Antarctic expedition ever organized.

"The stories of the men who participated on these adventures are nowhere to be found in history textbooks in our schools, colleges or universities," he wrote. "I don't know how many times I've been told that if not for my website, the stories would die."

Pierson estimates more than 35,000 people a month visit his site. He is also a member of the American Society of Polar Philatelists, a 500-member organization founded in 1956 that hosts conventions, exhibits and other activities.

More than 50 Antarctic philately sites based in numerous countries can be found on the Web, offering a variety of documents, history, auction updates and other information.

Michael de Jong, a resident of the Netherlands, operates an online polar philately mail list with about 260 members, along with a Web site with features such

See Postal on page 6

Dear sir, please don't write

The National Science Foundation has a procedure to support philately at a level not to interfere with the science mission, which can be found in more detail at http://www.nsf.gov/od/opp/philatelists.htm. Below is an excerpt:

While in Antarctica, you may receive unsolicited philatelic mail from collectors. The Foundation discourages this unauthorized philatelic activity, and you will be entirely within your rights in declining to respond to such unsolicited requests. Please discard the material in the appropriate recycling container. If you receive large amounts of unsolicited philatelic mail, bring it to the attention of the station manager or the NSF Representative.

Philatelists may obtain a maximum of two covers (self-addressed stamped envelopes) a year by writing to the postal clerks at the three year-round U.S. Antarctic stations. No more than two covers per person per station per year. Covers will be processed for personal, noncommercial use of individuals only.

Covers are not processed if the guidelines are not followed.

Philatelic mail is processed and returned to senders as soon as possible, but the processing is in addition to regular duties of station personnel. Some processing is done during the austral winter, when Antarctic stations are isolated, resulting in year-long (or longer) delays in mailing covers back to the collectors.

Philatelic Mail Clerk
McMurdo Station,
Antarctica
PSC
469 APO AP 96599-1035

Perspectives

Nuts in a nutshell: More self-absorbed palaver on our own uniqueness

By Salvatore Consalvi

A journal is a person's search for meaning from within the archive of his or her own thoughts. Three seasons of journal entries and I haven't stopped wondering about this place. There remain many questions concerning the connection between the landscape and the culture/subculture/remedial culture that arrives each season. What are you teaching me, protecting me from, representing in my subconscious?

As far as coming back year after year is concerned — I have nothing better to do. Since deciding a career was a "demeaning 20th century invention" (ref. *Into the Wild*; Krakauer) the manner by which I feed myself has lost relevance. What were most computer programmers last decade but glorified factory workers? In college I spent 40 hours a week putting plastic balls in the valves of plastic breast pumps. You can't tell me that that was less fulfilling or more valuable than changing code for the Y2K scare (ref. *Office Space*, the movie).

Additionally, due to a penchant for travel, I find myself in debt and under the poverty level every April (actually I do my taxes in August). But these forms of social anarchy or fiscal insanity cannot fully explain the recidivism of which I speak.

Why return to a continent denuded by nature itself? Or is that it? At the deepest level, does nature suggest that beauty and truth exist equally within the excesses of our culture, the diversity of tropical environments and in this isotropic landscape? Are we to learn something from this nothingness, from the antithesis of excess? We are here allowed to contemplate time by the motion of glaciers. Do these symbols of geologic time hold some psychological, archetypal significance? Are the practices of the most simple Bahamian fisherman, the poorest artisan, or most beleaguered GA, DA and janitor as worthwhile as our most envied celebrities and what's more, as much as our greatest minds? Is doing nothing; taking yourself as far as possible out of the *carera de los rattones* the best thing you can do for the earth, the universe, the cosmic consciousness? The answer is obvious, but try suggesting that to your accountant.

I don't expect that most of us consciously consider these things, but is there a metaphysical search, common to all of us, that lurks beneath the surface? Probably not . . . but I'm on a roll!

In a time when 30 miles, an easy two-day walk from a road, qualifies a dot on the map as the most remote place in the Lower 48, we are afforded the great privilege of living on the outskirts of a vast wilderness. Or more exactly, in a sty, a boil, a cancor that has developed on it. We are given the opportunity to consider what wilderness is and the relationship we as individuals and cultures have established with it.

Wilderness. The concept fits within the strata of the human consciousness like a trace element. We may not feel its presence in our daily life, but it remains in our psyche like the layers of ash from major eruptions that mark significant epochs. Certainly there is a cultural aspect to how we process the term. The emotions the word generates in our imagination mark how far we have developed or digressed. To most mere-consumers the wilderness is a fearful place that regrettably contains the resources required to feed our newest demi-god . . . the economy. They, the tiny-Americans, fear the wrath of a bad economy like the "primitives" feared . . . well I have no idea what they feared. But the material-minions fear thunderbolts of high oil prices, tremors of low GNP, and the tsunamis of high unemployment far more than most of us, who I like to refer to as Antarcti-cats, fear dying or public speaking.

Even as the language of modern cosmology approaches that of ancient religion and myth we ignore the possibility that the wilderness is an entity all its own, a living breathing sentient thing. Here on the Ice, scientists access the memory of the planet in the strata of ice and ancient atmosphere frozen in the present. And I'm not making this up! The LTER project describes streambeds and algal mats as ecological memory patterns. It's only a matter of time before some daring PI states that Ice Stream C felt bad that it could not communicate with us or was lonely when they began studying Ice Stream D. Well . . . that may not happen for a while. But Stephan in supply is presenting a cosmology video series that suggests the universe and everything in it exhibits consciousness. And further . . . has feelings. Where else but Antarctica, or a 19th century German patent office, will you find out that the guy distributing your manila folders is an expert in quantum physics? In other words, there is an informal component of the community led by an expert volunteer that represents modern mankind's search for its cosmological myth.

I'm afraid I'm sounding insane again. I'm surprised it took eight paragraphs.

What is insanity but freedom? Liberation from "logical" behavior, from spending lifetime after lifetime in the pursuit of safety, comfort and security at the cost of your soul. One day I may enjoy the style of insanity that will allow me to stop wearing pants in public, but for now I have to settle for what I can get. I take pleasure in thinking that this form of freedom creates fear in the hearts of the hawkish and disappointment in the wee cold recesses of the global shopkeepers who were counting on the passage of my life being donated to their bottomline. Is this shift in favor of simplicity and freedom another yearning common to this ephemeral community? Do we congregate in the frigid confines of McMurdo since these curiosities are not sated in the saloons, salons, bistros, or universities of our hometowns?

The people here are cold-filtered to remove the forms of idiots that distract and irritate me the most. Am I suggesting that we are free of stupidity? Of course not. I've been to the bars on the weekend. I don't like you people enough to ignore the truth.

I am suggesting that certain discrete forms of ignorance, of human folly, are statistically lower to some incalculable, highly arguable degree and that this creates the intangible sense we are connected at some level, other than our need to own more.

These behavioral anomalies create the illusion of existing temporarily in a haven. Protected from the mundane, from the inane, insipid lives of those that fear loss of opportunity more than they fear being on the wrong side of a moral issues. Those that fear doing without the smallest of comforts, the most artificial of manufactured needs, more than they fear intolerance, ignorance, violence perpetrated on their behalf. People whom fear being different more than they fear dying of boredom.

Sal Consalvi is the environmental technician at McMurdo Station.

around the continent

PALMER

See you on the radio

By Tom Cohenour
Palmer correspondent

The recent visit of the research vessel *Laurence M. Gould* brought big changes to Palmer Station. Each January at this time, the *L.M. Gould* hosts the month-long LTER (Long Term Ecological Research) cruise.

Eight scientists from Palmer joined others aboard the *L.M. Gould* for the cruise, while 12 people disembarked to work at station.

Among those getting off to work at Palmer was Dan Grossman, whose keen interest in phenology and paleoclimatology brought him all the way from Boston. As an independent radio producer and print journalist, Grossman's work has frequently been broadcast on National Public Radio and published in numerous national magazines.

While at Palmer, he'll be producing three stories and one documentary to be aired via radio. One story will explore the impact of tourism on Antarctica while another will take a look at the impact fishing has on the Patagonian toothfish (Chilean sea bass).

Grossman's third story, and a large part of his documentary, will cover the work of Bill Fraser, principal investigator with the Seabird Component of the Long Term Ecological Research project, whose study of seabirds around Palmer spans 28 years.

Using a hydrophone, Dan also plans to record sounds of whales, Weddell seals and other sea life. Check out www.wbur.org/special/antarctica for further details on Dan's work.

The increased need for volunteer dive tenders was another recent change at Palmer. Incoming scientists studying macroalgae and invertebrates conducted successful check-out dives and immediately began their underwater work.

A dive tender assists science divers by helping them get into their dive gear, carry scuba air tanks, stand watch for potentially deadly Leopard seals and help haul heavily equipped divers into the zodiac when the dive is complete.

Photo by Tom Cohenour/The Antarctic Sun

Radio producer Dan Grossman collecting radio stories for NPR at Palmer Station.

Also arriving at Palmer were about 90 tourists, mostly Americans, traveling on the Russian icebreaker *Kapitan Khlebnikov* who paid an afternoon visit to Palmer Station. Their 62-day circumnavigation of the Antarctic continent began in New Zealand with stops at bases of several countries.

After hosting the tourists on-station, personnel from Palmer were invited aboard the *Khlebnikov* for a complete tour of the 420-foot (129-meter) ship, including a chance to mingle with some of the passengers in the lounge.

The ship - built in Finland, owned by the Russians and chartered by Americans - is a true icebreaker capable of traveling in open seas at 15 knots.

SHIPS

New geology cruise

By Chris Kenry
NBP correspondent

The *Nathaniel B. Palmer* arrived at the ice edge about 50 miles (80 km) from McMurdo early last week, thus ending the last cruise of 2002. To celebrate we had an evening barbecue on the ice and all learned something about the importance of sunblock. The next day the departing science party began its helo exodus to McMurdo and we, the remaining crew members, had a few quiet days to regroup and prepare for the next set of grantees to arrive.

I can tell we've been at sea far too long when I start getting interested in geology and geophysics. The thought of acquiring deep penetration data and bottom mapping, and all of that coring and drilling excites me. And this next cruise promises to be especially exciting as it will involve all of that and more.

Co-PI's Bruce Luyendyk and Lou Bartek — along with seismic experts John Diebold, Dan Harold and a group of students from the University of California, Santa Barbara and the University of North Carolina — have boarded the *N.B. Palmer* for a three-week seismic survey of the southern Ross Sea. Their objectives during this cruise are to understand the history of the Ross Sea during the Mesozoic Era and to study the history of Cenozoic Era glaciation. To do that they will conduct a seismic site survey and take piston cores a kilometer or so north of the ice shelf front with the hope of using that information for a future drilling venture on the Ross Ice Shelf.

At this point you may be scratching your head and wondering why they are doing marine seismic for an ice-based drilling project. Well, the trick is that the area being surveyed (thanks to our behemoth friends, icebergs B-15 and C-19) is currently open water, but in a few years it may not be. In two to four years Luyendyk and Bartek figure that the ice shelf will have moved northward and covered the area they plan to map on this trip and that, in turn, will enable them to drill. In addition, the data collected on this trip will allow the scientists to discover how active the currents and sediment deposition have been under the ice shelf.

Our departure for this cruise has been delayed a few days as we wait for the arrival of the man that many aboard the *N.B. Palmer* refer to as "god." In this case god is Marine Technician Jay Ardai, who was given that revered title for his knowledge of and ability to fix the often temperamental seismic equipment. Once he arrives the vessel will set sail for three and a half weeks before returning to McMurdo at the end of January.

the week in weather

McMurdo Station
High: 42F/6C Low:23F/-5C
Wind: 37 mph/59 kph
Windchill: -8F/-22C

Palmer Station
High: 46F/8C Low: 28F/-2C
Wind: 23 mph/37kph
Rain: 0.3 in/8 mm

South Pole Station
High: -9F/-23C Low: -19F/-28C
Wind: 22mph/35kph

Postal

From page 3

as classified ads and photos of Antarctic post offices. He said interest in the site has expanded "explosively" since he started it three years ago.

Discussions typically focus on polar postal history and "covers" – the philatelic term for postmarked items, de Jong wrote in an e-mail. The items most of interest, predictably, are often those hardest to find.

"It's not only the postmarks polar philatelists are looking for, but also the cachets of the various expeditions, ships, current research campaigns, etc.," de Jong wrote. "Also to many polar philatelists a cover is even more valuable when it bears the autographs of polar scientists, expeditioners and personnel."

Items from Sir Ernest Shackleton's expeditions are probably the most sought after by collectors, followed by anything preceding the U.S. postal presence in 1928, Pierson wrote. He said such items are exceptionally rare and even souvenir pieces created during those years often sell for hundreds of dollars. Genuine mailings, such as letters from expedition members, can go for much more.

"I've personally never seen a letter posted and signed by Scott or Shackleton while in Antarctic waters, but I know that a few exist," he wrote. "Dig in your wallet for probably $5,000 or more."

Smith said if money were no object the item he would be most interested in obtaining is the diary left in Robert Falcon Scott's tent from his doomed expedition to the South Pole.

More recent events also attract collectors. De Jong said one of the items he finds most interesting is a 1986 cover featuring the motor vessel *Greenpeace* during its voyage to establish the now closed Greenpeace World Park base on Ross Island.

"What makes the cover particularly interesting is that it's signed by the members of the first World Park Base overwintering team," he wrote.

"Another cover that is quite common, but which I find fascinating, is a 1957 cover from the old South Pole Station. What makes it fascinating to me is that it was postmarked in a post office that now lies buried under meters of snow and ice."

Collectors also seek out stamps with Antarctic themes. The first stamps produced specifically for use in the Antarctic, according to the commercial Web site Antarctic Philately from New Zealand, were issued by the New Zealand Post Office on Jan. 15, 1908, and used on mail by members of Shackleton's Nimrod expedition that year.

Pierson said stamps from that expedition, as well as Scott's Terra Nova expedition from 1910 to 1913, can cost thousands of dollars. But more modest options are available.

Photo by Mark Sabbatini/The Antarctic Sun

Ralph Godinez, an electronics technician aboard the Polar Sea *icebreaker, sends a package to his wife from the McMurdo Station post office.*

People interested in starting a collection can do so easily for less than a dollar by sending a self-addressed stamped envelope to one of the stations operated by the U.S. Antarctic Program.

About 10 philatelic requests arrive with each shipment of mail at McMurdo Station, said Christine Hush, the station's postmaster. She said Palmer Station is less popular, since mail is sent to Denver for processing rather than being stamped there. Enthusiasts generally agree the South Pole is the most popular of the U.S. stations.

The U.S. Antarctic Program allows philatelists to send two covers each year to each of the stations for processing. Workers deploying to the Ice are warned they may be targeted by people seeking more.

"While in Antarctica, you may receive unsolicited philatelic mail from collectors," the program's participant guide states. "The (National Science) Foundation discourages this unauthorized philatelic activity, and you will be entirely within your rights in declining to respond to such unsolicited requests. Please discard the material in the appropriate recycling container."

Hush said they try to accommodate requests from collectors who are on-station as program participants as long as they don't interfere with normal postal operations.

"If they're a collector they could use some envelopes and have them postmarked in a reasonable amount," she said. "We can't have hundreds of them and have them done while everybody's standing in line (for regular mail)."

Smith said residents of Germany and France seem to send the largest number of requests to the South Pole, but mailings come from all over the world.

"Requests come from people of all ages," he wrote. "People who have been collecting things from Antarctica since the days of Amundsen, Shackleton and Scott to schoolchildren."

Letters don't have to come to Antarctica to be postmarked. The Post Office in Cathedral Square in Christchurch not only sells stamps from the Ross Dependency in Antarctica, but also can frank mail with the Ross Dependency postmark, a trick Antarctic participants can use if they didn't get letters mailed home from the Ice.

Another easy way to find collectibles is through dealers. Sheets of stamps featuring penguins, maps, historic explorers and other Antarctic-related art often sell for as little as a few dollars. They also will send envelopes and other mailings to various locations on the Ice where people will cancel them and send them back.

Pierson said polar philatelists may be somewhat limited in number, but compared to those who collect other types of stamps their interest in the subject is strong.

"The history of exploration, particularly in the southern region, is the most exciting – and tragic – of any place on Earth," Pierson wrote. "Thank goodness many of the brave souls that ventured to these dangerous places authenticated their sojourns by writing home to family members and beneficiaries."

A shaky view of the sun

By Mark Sabbatini
and Kristan Hutchison
Sun staff

Scientists in a shipping container buried under the ice near the South Pole are using the sounds of the sun to map activity that can't be seen.

An improved map of the sun's lower atmosphere could enable better predicting of activities such as solar flares and coronal mass ejections, said Stuart Jefferies, the principal investigator of the project. Better forecasting could minimize problems caused by flare-ups, including large-scale power outages and damage to satellites.

The project also may answer mysteries such as why the sun's outer atmosphere is hotter than its surface, Jefferies said.

"We don't know what to expect at the moment, because this is a new area we're pushing into," he said. "What we're interested in is, can we detect changes in sound speed that are happening over periods of days and weeks, and does this tell us anything about the evolution of the magnetic field?"

The project, funded by a National Science Foundation grant, is a joint venture between the University of New Mexico's Maui Scientific Research Center and the physics department of the University of Rome.

Studying seismic activity on the sun – known as helioseismology – is similar to earthquake studies on Earth, except on the sun no single source generates solar "seismic" waves. Instead they represent a large number of activities in the sun's convective region, according to a report by Jeffries' team, "so the ringing sun is like a bell struck continually with many tiny sand grains."

Jeffries and five other scientists are charting the maps from high-frequency sound waves generated just below the sun's surface. The technique has been used for 20 years to study the sun's core and surrounding convection zone, but Jefferies' group is the first to apply the technique to the solar atmosphere.

They also are studying sound waves at a higher frequency – more than four – than is traditional for solar seismology. Such sounds are far too low in pitch to be heard by the human ear, but a single wave raised several octaves to bring them within hearing range would sound like a tuning fork. All together, the waves – occurring randomly in millions of places at once – would sound like static.

Photo by Mark Sabbatini/The Antarctic Sun

Paolo Rapex, an electronics technician from the University of Rome, prepares to enter the lab where a team of scientists are studying seismic activity on the sun. The lab is buried in the snow to minimize the impact its heat would have on a telescope, seen on a hill in the background, that records the solar data.

The visible part of the sun's surface is the photosphere, while the chromosphere is the portion of the atmosphere being studied by Jefferies' group.

"You usually see the chromosphere most easily during eclipses," he said.

The low-frequency sound waves bounce around the sun until they run out of energy, causing movements within the sun as they do so. The high-frequency waves just exit the sun after a single round trip to the interior.

Observation of these movements is being conducted through the Magneto Optical filters at Two Heights (MOTH) instrument. It has two telescopes in front and two magnetoptical filters, one filled with sodium and the other with potassium vapor. The instrument focuses on the sun's atmosphere at two different heights – about 120 miles (200 kilometers) above the surface for the potassium filter and 300 to 420 miles (500 to 700 kilometers) for the sodium filter – measuring the wave pattern and its travel time.

Four cameras at the back of the instrument take 10 photos per second, which are integrated into a single image every 10 seconds as the "eyes" of the telescope follow the sun around the polar sky.

"We will use a time-distance analysis of the high-frequency component of the observed signals to produce detailed maps of the acoustic wave travel-time across the lower part of the solar atmosphere," Jefferies wrote in a summary of his project.

"The travel-time measurements will then be inverted to give maps which show how the speed of sound changes in the solar atmosphere, both with location and time."

Getting readings at different levels may also help solve the mystery of the sun's various temperature levels. The sun's core is about 27 million degrees Fahrenheit (15 million C), the surface about 6,000 degrees Fahrenheit (3,300C) and then the temperature rises again to about 1 million degrees Fahrenheit (550,000C) in the corona.

"Nobody knows how the heating of the upper atmosphere is taking place," he said.

The South Pole is an ideal location to study the sun's seismic waves because the atmosphere is exceptionally pure and the sun is visible 24 hours a day during the summer. But even in a place this remote and cold, certain steps are needed to keep man-made heat sources from causing turbulence in the atmosphere that would

See Sunquakes on page 8

At right, Stuart Jefferies, left, and Paolo Rapex study solar seismic data in their snow-buried lab. Above, a telescope that observes the solar atmosphere at two different altitudes follows the sun throughout the day.

Sunquakes

From page 7

affect their accuracy of their readings.

"It's like looking at a road on a hot day," Jefferies said. "It shimmers."

The observatory is four miles from Amundsen-Scott South Pole Station in order to keep numerous heat sources there from interfering. But even the observatory's computers and other electronics are enough to affect measurements, which is why the lab is buried and the telescope is located about 100 feet away on a hill of ice.

The key to getting good readings is a long stretch of good weather so the telescope keeps collecting data.

"The longer a time series you have, the better," said Wolfgang Finsterle, one of the researchers working with Jefferies. "It's no good to have periodical interruptions like day and night."

Clouds were a problem for the team during its initial weeks of research, with the team unable to get more than a single three-day reading. Jefferies, who has participated in a number of previous solar activity projects on the Ice, said researchers got anywhere from three to 50 straight days of clear weather during those seasons.

"Tomorrow we could be in hog heaven for two weeks or we could be scrambling for the rest of the season," he said.

Keeping the machine running also proved to be a problem early, due to some apparent system glitches. Jefferies said the bugs have been fixed and as of last week the team was enjoying a stretch of good weather.

"Once we are running we just have to watch the computer to make sure it doesn't crash," he said.

It took about three weeks for South Pole workers and projects researchers to dig the pit for the observatory and set up the camp, Jefferies said. There is enough room for all five researchers to squeeze into the lab if necessary and a sleeping trailer is a quarter-mile away, but for the most part participants spent their first few weeks commuting by snowmobile to and from the South Pole station.

"We try and arrange it so we do shifts, just for sanity reasons," he said.

Two members of the team left last week, however, meaning the remaining three will work mostly full-time at the lab until they depart the Ice in early February.

Studies of the sun's interior during the past 30 years have resulted in a number of discoveries, including the fact that the sun's equator rotates faster than its poles, Jefferies said. He said the main goal of his project is to further understanding of solar patterns and activity, but there are some practical applications as well.

Operators of satellites, for example, could take preventative action during solar

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a.m. Tuesday from the South Pole.

The team returned to Byrd camp, where the tractor treads were fitted with wider runners, including one pair shipped from the U.S. to the field camp in eight days. One sled was also swapped for another borrowed from the New Zealand Antarctic program, which was on skis designed to shed snow. The traverse departed for the second time Dec. 7, but two members of the expedition were forced to leave because the delay would keep them from reaching the Pole in time to return and to fulfill other prior commitments.

A number of natural factors continued to hinder progress, including an El Nino-like combination of heavy snowpack and relatively warm weather. Uneven terrain and whiteout conditions during storms led to further delays. But the equipment and participants completed the trip without further serious incidents.

"I think it went as well as it could," said Betsy Youngman, a Phoenix science teacher who joined the traverse as a field assistant. "It took me a while to adjust to the fact it was so slow."

"I was really impressed by how the team held together," she added.

Mayewski said he had no doubts the traverse would reach the Pole – although not necessarily with all the equipment they were carrying – even though the conditions were worse than expected.

"If we had had a low snow year we would have gone cruising through this, even with the equipment we had this year," Mayewski said.

U.S. ITASE members collected data for 11 projects during the trip through methods such as extracting snow and ice samples, taking shallow and deep radar readings of the area, and using balloons to measure atmospheric chemistry. Their initial delay meant they spent two to three days at each site, a day or two less than originally planned, but researchers were still able to collect data for all of their projects without any serious problems.

"There was nothing scientific left undone," Mayewski said.

Some on-the-fly adjusting was necessary. Jim Laatsch, a field assistant from Dartmouth College making his first traverse, said he thought he would be largely an observer of a shallow subsurface radar system gathering information about snow, ice and other substances as the traverse progressed. But the early departure of two team members forced him to take over the radar mapping, with the help of some other participants working on other projects.

Photo courtesy of Dan Dixon/ITASE

Researchers from the 2002-03 International Trans-Antarctic Scientific Expedition collect a variety of snow, ice and weather data at one of their field camps. The "trains" of science and living huts being pulled by agricultural tractors can be seen in the background.

"That was probably one of the best accomplishments of my life," he said.

The traverse was also forced to alter its route Dec. 18, shortly before reaching its third research site, because of poor snow conditions and relatively steep hills. Mayewski said the average grade during the traverse was only about one to five meters per kilometer, but "when you're in deep snow and you don't necessarily have all the clearance you need below the (vehicles) that's all it can take."

Gordon Hamilton and Blue Spikes, who were using high-precision GPS instruments to measure the accumulation and melting patterns of the ice sheets, devised a new route using satellite and topography data.

"That's the beauty of modern travel," Hamilton said. "You have those satellite images so you can make changes on the fly."

The expedition reached the bottom of the world on Jan. 2, although it did not go directly to Amundsen-Scott South Pole Station. Instead it veered about five miles out of the way to the South Pole Remote Earth Science Observatory (SPRESO) site, where drillers making holes for seismic instruments had saved a 1,000-foot (300-meter) ice core for ITASE and other researchers to study. That core, much deeper than those extracted along the traverse route, may contain up to 3,000 years of climate data.

"The Pole was absolutely surreal because we were in this vast nothingness by ourselves," Laatsch said. "All of a sudden there's this station. It's like a shipwrecked man seeing an island."

Still, there wasn't much of a welcome when they arrived – it was 3 a.m. at the SPRESO camp and 2 a.m. when they pulled into the South Pole station a day later. They soon found themselves the center of attention, however, first from the station's 220 residents and soon after from reporters worldwide wanting to know how the season turned out.

But most of the researchers weren't quite done with their work: Some collected additional ice and atmospheric samples at the Pole. Others returned to Byrd camp to retrieve equipment. Finally, four members, accompanied by a video cameraman, participated in a 60-mile (100km) mini-traverse toward the Pole of Inaccesibility.

"That is a region of lower (snow) accumulation," Mayewski said, explaining that such conditions are likely to be found elsewhere along the Transantarctic Mountains.

When they returned it was time to face the outside world, as participants began making plans to return – late in many cases – to research and teaching work. It was also time to face the media.

Mayewski said his first interview began at about 4:30 p.m. and he continued giving interviews intermittently through

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Breaking glass to make something new

By Anne DalVera

Glass beverage bottles are emptied rapidly throughout McMurdo, South Pole Station and field camps, whenever and wherever a party occurs. What happens to your empty bottle after you place it in the glass bins? Of course, you would take the cork off your wine bottle and put it in a burnables bin.

Janitors and bartenders put the bags of glass bottles into glass triwall boxes outside the buildings. When the triwall is full, a waste equipment operator picks up the box with a forklift and carries it to the waste barn, where it is staged with other boxes until the demand for empty glass triwalls exceeds the reluctance of the crew to crush glass.

Crushing glass is one of the least favorite tasks of the waste technicians. It is extremely noisy, repetitive and can be dangerous. Technicians look like space adventurers with heavy-duty dust masks, full face shields, ear protection and large rubber gloves to protect them from glass dust. They pull bags of glass bottles from the triwalls, tear open the bags, and sort the glass into clear, green and brown. Each color of glass has its own crusher. A technician tosses bottles into the correct chute above his/her head. The glass falls down the chute and is broken by a rotating hammer. The pieces, called "cullet," fall into a 55-gallon drum.

When the drums are full, they are pulled out from under the crushers and a lid is secured onto the drum. The 600-pound drum is identified by the color of glass cullet. Another technician uses an M4K pickle forklift to move the drum into a milvan for shipment to the U.S.

After the container ship arrives at Port Hueneme, Calif., the 13,000-pound glass milvans are loaded on semi trucks for the 15-mile trip to Del Norte Recycling and Transfer Station, where the glass is combined with a greater quantity of glass of each color from the town of Oxnard. There are no glass remanufacturing facilities in Southern California, so it is shipped out of state, where it is remanufactured into new glass bottles of the same color.

The glass market is not paying for glass, especially such small quantities as the U.S. Antarctic program generates — about 71,000 pounds — because they get plenty from the nation's curbside recycling programs.

The Antarctic program pays to recycle its glass, but gets some savings from clear or white glass, says Ken Bell of Best Recycling.

"We achieve most of our savings due to the extensive sorting done on-ice," Bell said. "The savings are half of the cost of disposal."

Photo by Anne DalVera/Special to The Antarctic Sun

Sarah Wright tosses a beer bottle into the brown glass crusher while Denise Grimm sorts bottles.

Our glass is great quality due to the technicians' handling of each bottle and taking the time to remove all caps and corks before the glass is tossed into the glass crusher.

We use a variety of glass products in the program, from windows to glass beakers and water and wine glasses. Unfortunately, those types of glass are not recyclable.

Some participants in the U.S. Antarctic Program have interesting connections to glass away from the Ice as well. Astronaut and meteorite hunter Cady Coleman says that her husband, Josh Simpson, a renowned glass artist, prefers to use recycled clear glass cullet in his work. It produces far fewer noxious fumes when melted than creating glass from sand. Simpson uses blown glass techniques to create beautiful "planets" from one and a half inches in diameter to basketball size, with a myriad of interesting shapes and colors throughout. These worlds surprise people and delight the imagination. They can last centuries and have been placed around the world. Some of Simpson's glass planets are even in Antarctica.

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the night until a Japanese film crew wrapped things up at 8 a.m. the following morning.

But Mayewski said he didn't mind the effort – or the occasional odd comment, such as one story's reference to the team getting more aerodynamic sleds (the trains traveled an average of less than 5 mph). He said the stories help better inform people about issues ITASE and other projects are studying, such as global warming and climate history, and why there is a need for such research.

The traverse was the first large-scale scientific traverse to the Pole in about 40 years, but it's possible many more road trips may be in the station's future. In addition to the next proposed ITASE trip, National Science Foundation officials are studying the feasibility of an overland supply route from McMurdo Station to the South Pole, to bring supplies such as fuel and construction materials by ground instead of air. An overland route could be more reliable, since it wouldn't depend on weather, and would also free up more ski-equipped LC-130 flights to support science projects on remote parts of the continent.

Although the cargo traverses would be different in nature from the ITASE traverse – likely a larger convoy without the scientific research stops – members of this season's traverse had a few words of advice for individual travelers – mostly to pack light.

Keeping personal gear to a minimum and using lighter scientific items where possible – such as plastic containers instead of metal – may save only a few thousand pounds, but those can be critical, Hamilton said.

"Pack only what you need," he said. "That's what we thought we did. We were lean, but still at times fairly heavy."

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charge of the water system at Amundsen-Scott South Pole Station. "It's so pure we have to add stuff to it to (bring it) to U.S. standards."

McMurdo and Palmer stations also end up with water so pure they must add limestone or soda ash to the water to raise the hardness and pH levels. In their case it's because the water has been sent through a reverse osmosis system that allows only the water molecules through, filtering out salt and any other minerals or impurities. If additives weren't put into the water it would leach the metals out of the pipes. This is a particular concern at McMurdo Station where many of the pipes were connected with lead-based solder, so calcium is added to McMurdo water to make it less aggressive.

"When there's nothing in it, it looks for stuff," Smith said. "It's aggressive. You need to make it neutral."

Water at all three stations and the field camps is tested regularly to make sure it meets Environmental Protection Agency standards, said Joel Murray, environmental technician in charge of water quality. Chlorine is also added to the water at the larger stations as a preventative.

Drinking ice water

At the South Pole, the two blue pipes carrying water in and out of the Rodriguez well look identical, but they're easy to tell apart by touch. One is as warm as a fresh mug of tea, the other like a chilled glass.

The cold pipe pumps melted ice out of the well at 14 gallons (53 liters) a minute. The warmer pipe carries excess heated water back into the well, where it sprays it out like an upside-down, heated sprinkler. The sprayer is initially lowered 6 to 12 inches (15-30 cm) a week as the bottom of the well melts down.

"We kind of chase the water down the hole until it runs out," Smith said. "The deeper you go, the harder your pump has to work, the more energy you have to put in to melt the same amount of ice, the more cost to run it."

When the well gets down to about 500 feet (150 m), usually in about five years, a new Rodriguez well is started by drilling a hole 80 feet (24 m) into the ice and injecting 2,000 gallons (7,560 l) of hot water. The spray head and well pump are installed and the heated water is circulated to melt a sufficient bulb before any of the water is used.

The old well leaves an empty bulb, about 500 feet (150 m) deep and 300 feet (90 m) in diameter, which is hooked up to the sewer pipes and refilled.

"We encourage a little more water usage per person in the winter, because it keeps the sewer bulb active and prevents an ice lens from forming and blocking the outfall," said Bill Henriksen, South Pole winter site manager.

Photos by Kristan Hutchison/The Antarctic Sun

Glenn Horning delivers water to the summer dorms at the South Pole from a tank on skis.The water deliveries continue until the temperature gets too cold.

The South Pole began using Rodriguez wells in 1995. It's a cheaper process than mining snow and melting it in a snow melter, as was previously done. Snow mining is still used in the winter for the elevated dorm and hypertats, which are too far from the dome to be connected to the main water system.

In the summer a loader tows a water tank to deliver water to the dorms twice a day, except Sundays, but after the temperature drops to –50F the water starts to freeze at the tank outlet as it was being moved. Instead, a front-end loader scoops buckets of snow from a clean area set-aside for that purpose and dumps it into a snow melter, basically a large, heated funnel.

"The problem with using surface snow in the winter, when it's dark, is there's a potential for contamination from the front end loader," Henriksen said. "Care has to be taken to prevent tracking over fresh snow and dripping hydraulics or other fluids from the loader into the snow." Henriksen said.

It also takes about a gallon of fuel to melt 40 gallons of snow, so melted snow water costs about 40 cents a gallon, Henriksen said, after calculating on a scrap of paper based on the average $16/gallon cost of fuel at the South Pole. Making water with the Rodriguez well is cheaper because water pumped back into the well is heated with waste heat from the power plant generators.

"It's not free, but it's a byproduct," Henriksen said.

The snow melt system will stop being used this winter, as the more distant dorms are closed down and people move into sections of the new elevated station instead, Henriksen said. The new power plant has the capacity to produce 6,000 gallons (22,680 l) of water a day, double the 3,000 gallons (11,340 l) the old plant could handle.

Even as the water capacity expands, water use will continue to be restricted because of the cost, Smith said. Everyone at the South Pole is allowed only two 2-

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minute showers and one load of laundry a week. The station goes through about 25 gallons (95 l) of water per person a day, mostly for cooking and laundry, Smith said. It adds up to 34,000 to 35,000 gallons (128,520-132,300 l) a week in the summer, when the population peaks at around 220 people.

Palmer Station, with fewer than 50 people, has more water per person – 14,600 gallons for the station in a typical week mid-December. And that doesn't include the toilets.

"The fresh water is used for drinking, cooking, showers, cleaning and science uses some that they filter even more," Palmer power plant mechanic Dave Ensworth wrote in an e-mail. "The toilets all use sea water."

Turning seawater fresh

Reverse osmosis systems at the two seaside stations have made water cheaper and more plentiful. Palmer Station used to pull water from a pond of glacial melt behind the station. A reverse osmosis system at Palmer generally produces about 1.7 gallons (6.4 l) a minute, Ensworth said.

At McMurdo Station, snow was originally scavenged from the hills and melted for water. In later years a flash evaporator was used. In 1994 the flash evaporator was replaced with a reverse osmosis system, cutting the cost of water in half. The McMurdo reverse osmosis units supply about 70,000 gallons (264,600 l) a day.

While reverse osmosis systems are common around the world, on cruise ships and Caribbean Islands, the cold waters of Antarctica make purifying salt water trickier, said Jordan Dickens, who manages the McMurdo water and power plants. The water sucked into the intake pipe is 28F(-2C). At that temperature it would freeze and destroy the fine membrane of the reverse osmosis filter, Dickens said. The water is heated to 37F(3C) and sent through preliminary filters to remove anything wider than a hair.

Still colder than Caribbean water, the Antarctic sea water is put under 850 pounds per square inch of pressure to force it through the reverse osmosis membrane. In the Caribbean it could go through at 600 psi.

Every three gallons of seawater produces a gallon of fresh water, which disappears down the drain in a fraction of the time it took to make it.

"As long as the lights are burning and the water's gurgling, nobody knows we exist down here (at the water plant)," Dickens said.

Solid water

At field camps people are much more aware of their water use, since they must gather and melt snow or ice themselves. Each camp has its own variation on the same basic system. Usually the pots of snow or ice sit a while inside near the stove, warming and waiting. A large pot with a spigot sits permanently on the stove, melting down as the room is heated.

At Marble Point and Black Island, two permanent outlying camps, the snow is scooped up with a bucket loader and dumped into a snow melter, said Randy Noring, camp manager at Marble Point. When the snowdrifts melt away, they start pumping water from a nearby lake.

Field camps on the plateau shovel the snow by hand, setting aside a clean sector upwind of the camp for the purpose. Then a dirty sector is established downwind of camp to empty wastewater.

"It's just the same thing, like you don't collect your drinking water downstream from your sewage," said Nevada Hanners, who spent almost three weeks as a cook at Tamseis Camp on the East Antarctic plateau.

Several times a day she shoveled snow into a gray garbage can, then pulled it back to the Polarhaven on a banana sled. Each garbage can load melted down to about 20 quarts. With each person in camp drinking a gallon a day, plus four gallons for dishes and four to six gallons for cooking, the quarts went fast.

"Basically, you're always doing water," Hanners said. "Sometimes we would have water going on the Preway (stove) and we would be melting it on the Coleman stove."

The result of all the work was delicious, Hanners said.

"There was no flavor at Tam. It was just good, clear water," said Hanners, who brought some back to McMurdo to drink. "The only flavor was if you didn't wash out your cup good enough."

In the Taylor Valley, where there's rarely any snow, campers go down to Lake Fryxel and Bonney with pick axes. They swing

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Water use

The biggest water user at McMurdo is the galley. Other typical water uses:

Shower — 5 gal./min. (2.5 gal./min. for low-flow showerheads)
Toilet — 5 gal./flush (1.6 gal./flush for low-flush toilets)
Laundry — 35 gal./load (18 gal./load for front-loaders)
Sink — 4 gal./min. (2 gal./min. with aerator)
Leaky faucet — 20 gal./day

Photo by Melanie Conner/The Antarctic Sun

A McMurdo resident enjoys a hot shower. The reverse osmosis water treatment system creates enough water for daily showers, while at the South Pole showers are limited to two minutes twice a week.

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like miners, diamonds of ice spraying up with each downward blow. When enough chunks break free, they set down the ax and put on gloves marked "ice only" to scoop the ice into water pots. Because ice is denser than snow, a potful goes further, so the chore is done less often than on the plateau.

At Lake Hoare, ice-gathering is a communal ritual, a bonding event in which people take the sled to the foot of the glacier where chunks of ice have calved off. They load these "glacier berries" onto the sled, drive them back to the camp and carry them up the hill to pile in a box beside the main building, like wood stacked for the fireplace.

"It only takes two people, but it just goes faster, you can get more glacier berries with more people," said camp manager Rae Spain.

By December, when the summer sun melts the glaciers into streams and fills the moat around the lake, the berry-picking season is over. Instead, Spain pumps water from the moat and carries it up the hill in 5-gallon jugs. When the camp is full, with 14 people staying there, the water jugs must be filled and hauled every other day.

"It's all good water. It all ultimately comes from the glacier," Spain said. "but I love the glacier berries. They're more fun. When you put them in the hot water, all the little bubbles come out. It looks like it is carbonated when you put it in hot water because it is releasing compressed air."

Sometimes visitors ask to bring a glacier berry back to McMurdo to serve in party drinks, bartering the water source for a bottle of some other beverage, Spain said. She also prefers Lake Hoare water to the desalinated and treated water of McMurdo.

Photo by Kristan Hutchison/The Antarctic Sun

A bucket of ice chips at Lake Bonney waits to be melted down for water.

"When I go into McMurdo I take two (full) water bottles with me," she said.

Not all camp water tastes sweet and clean though. Lake Fryxell's brackish moat leaves an algae flavor in the water, even after it's been filtered, Spain said.

"I like it when it has an earth flavor," said Hanners.

It's official, *Healy*'s coming

Unusual sea ice conditions in McMurdo Sound will require two Coast Guard icebreakers to insure that resupply and refueling ships can reach the station.

The U.S. Coast Guard vessel *Healy* left its home port of Seattle on Jan. 9 to sail south for roughly 27 days. On Feb. 4 or 5 it is expected to join the Coast Guard icebreaker *Polar Sea*, which has already made the initial cut through the ice to McMurdo Station, tieing up at the ice pier Jan. 10 to refuel.

The *Healy* is the Coast Guard's newest icebreaker and was designed with features aimed at the support of polar science, particularly in the Arctic. Coast Guard officials have assured the National Science Foundation that *Healy's* Antarctic deployment will not affect planned Arctic research.

The Coast Guard recommended sending *Healy* to assist in icebreaking operations, a recommendation with which NSF concurred. It is possible that *Healy* could be recalled if conditions do not warrant its presence in Antartica.

Last year extensive sea ice conditions also required that the *Polar Sea* and *Polar Star* be sent south together.

Al Sutherland, the ocean projects manager in NSF's Office of Polar Programs noted that the ice remains almost three times farther out from the station than is normal.

Healy is being deployed to help *Polar Sea* meet two challenges, Sutherland explained. The first is to break a channel through the ice to Hut Point at McMurdo Station and to keep it open. The second challenge is to escort a supply ship, called the *American Tern* and the fuel tanker MV *Richard G Matthiesen* into McMurdo to prepare the station for the long austral winter.

Under an agreement with NSF, the Coast Guard provides icebreaking services to the U.S. Antarctic Program. The additional cost to NSF to deploy *Healy* to Antarctica will be roughly $1.2 million. Additional fuel also will be needed at McMurdo Station to keep both ships running.

Continental Drift

What's the best Antarctic date?

"If my wife were here, she would be my best Antarctic date."
Mike Ebiston
McMurdo Station sheet metal worker from Rockford, Ill.

"I'm going to say Christmas Day because you're always guaranteed a nice snowy Christmas and everybody gets the day off."
Amanda Betz
South Pole cargo worker from Cheyenne, Wyo.

"It could be tomorrow because I haven't had my best date yet."
Jeff Gustafson
Palmer station carpenter from Warren, Minn.

Profile

From Russia with science

By Mark Sabbatini/*Sun staff*

Vladimir Papitashvili has been studying Antarctica long enough to remember when his native country of Russia worried how traveling through capitalistic nations would influence researchers on their way to the Ice. Now he's in charge of a science program run by the largest of those nations.

Papitashvili is the new National Science Foundation science representative at Amundsen-Scott South Pole Station. The adjustment is more personal than political, as he is making the transition from a researcher to someone who helps other scientists feel comfortable working at the Pole by solving any technical or logistical problems that arise.

"When you're a research scientist you only look at things from your perspective," he said. Being a science program manager "widens your horizons. You know much more about the science that goes on."

Papitashvili said he spends every day with his camera – which he calls "my diary" – taking dozens of pictures of people and places to help him stay current on what is happening with various projects. Many at the station know him as someone who has studied Antarctica for more than 25 years, including traverses to Russia's Vostok base and Dome C, and other locations, and assume he already knows a lot about what's going on.

"However, it's my first trip to the South Pole," he said. "Nobody believes me."

A number of researchers and station employees said they are still getting to know Papitashvili, who started working at the Pole only a few weeks ago, but words like "sharp," "organized" and "asks questions" were among the early impressions.

"He's going to take an interest in the place like I've never felt before," said Paul Sullivan, a Denver resident who has worked at the South Pole since 1996 and Antarctica since 1994.

He also made an impressive wine steward at Christmas dinner, staff said.

The role of head NSF science representative has been filled with rotating NSF staff, or performed by NSF Station Representative Jerry Marty in recent years. But with construction of the new elevated South Pole station taking up more of Marty's attention, the need for a longer-term science representative was clear.

"If (research grantees) see an NSF presence on-station they'll feel like they'll be more listened to," Sullivan said.

In addition to "troubleshooting" at the Pole, Papitashvili is responsible for reviewing grant requests during the off-season as the NSF's Office of Polar Program's manager for Antarctic Aeronomy and Astrophysics. He said he has been hired by NSF as a "rotator," meaning he will spend two years in the position before returning to his research work.

Papitashvili graduated from the University of Leningrad in 1969 with a degree in geophysics and geology. He then went to the city of Yakutsk, in the middle of Siberia, home of the Institute for Permafrost Studies, where temperatures of-67F (-55C) were considered normal.

He spent six years studying the electromagnetic properties of permafrost at various locations across the Russian Arctic. He also had a curiosity about Antarctica, but there was no program in his country for studying permafrost in Antarctica at the time. He argued there was more to study in Antarctica than just ice, but was told it was too far away.

Papitashvili eventually moved back to Moscow with his wife, which she felt was a place better suited to raise their kids. There he went to work for the Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation. He began doing geomagnetic studies of Antarctica, but at first his efforts to go to the Ice himself were rejected because he was considered too young.

"The main reason wasn't because it was Antarctica," he said. "It was considered a foreign trip through the capitalistic centers."

In 1979 he applied to be a Soviet exchange scientist at Siple Station, but the conflict with Afghanistan temporarily halted Russia's collaboration projects with the U.S. Antarctic Program.

He got his PhD in 1981, which is when he said he wanted to go to Antarctica. Two years later he would get his wish, leading a scientific traverse from Russia's Mirny base to Dome C, where his work included helping Australians measure the speed of ice movement.

The trip also featured its own bit of history: One of the men had to have his appendix removed in the field, which Papitashvili said is the first and last surgery during a traverse that he is aware of. He said they rejected offers to evacuate the man by air because of the difficulties building a runway 600 miles from Mirny would entail.

"Me and a mechanic were surgical nurses to a professional surgeon we had in a traverse team," he said.

The Australian connection from that trip led to other Antarctic projects, although he sent an assistant to do the actual work on the Ice.

In 1991 he was invited to come to the U.S. for a year as a fellow for the U.S. Office for International Solar-Terrestrial Energy Program (STEP) at the NASA/Goddard Space Flight Center. In 1993 he joined the University of Michigan as a research scientist, where he worked until accepting the job with NSF. During those years he also participated in a few Antarctic expeditions through the U.S. Antarctic Program, including installing a transmitter at Vostok in 1997 that sends geomagnetic data every 12 minutes through a Japanese geostationary satellite. Data from the satellite can be seen at http://www.sprl.umich.edu/mist.

Papitashvili noted that while 20 of the 29 current science projects at the South Pole station belong to the program he manages at NSF, little if any of the work involves studying the Pole itself. Instead, researchers focus on the skies for astronomy, geomagnetic field and aurora, getting readings not possible elsewhere in the world.

"We are using Antarctica as a platform," he said. "and this is a great place to be."

Photo by Mark Sabbtini/The Antarctic Sun

Vladimir Paptashvili sits in his office at Amundsen-Scott South Pole Station and looks at photos of himself from his first visit to the Ice, 20 years ago.