



December 22, 2002

Skuas devour an abandoned penguin egg at Cape Royds, where extensive sea ice is forcing penguins to leave their nests for the second year in a row. Researcher David Ainley believes the colony may be dying. See story on p. 9



Photo by Melanie Conner/The Antarctic Sun

Sights and sounds at Weddell World get seal of approval

By Mark Sabbatini
Sun staff

For the most part they lay around looking like large sausages on the ice, scarcely distinguishable from rocks. At least that's the surface impression.

But look deeper and it turns out a good part of their time is spent fighting with a gladiator-like ferocity for necessities like food and air, often causing a ruckus that surpasses the volume of any rock concert.

Such is the view from "Weddell World," a roving field camp near McMurdo Station where a team of researchers has amassed an unprecedented collection of data about Weddell seals during the past five years. Related projects may lead to advances in the human world as well, such as treating

heart ailments and dietary deficiencies.

One of the keys to their National Science Foundation-funded project is new technology including small video cameras mounted to the heads of the sea mammals.

"It wasn't just the underwater video – it was the data being matched to the video," said Terrie Williams, a biology professor at the University of California Santa Cruz who is one of the project's three primary investigators. "We're seeing for the first time what no one else has seen."

Williams, who made the comparison of sausages with seals at rest, said that accounts for only about 10 percent of their time. Much more of their life is

See Weddell on page 12

A holiday cheer from Antarctica

By Mark Sabbatini
Sun staff

James Battaglia knew the chance to greet the country on national television was an opportunity not to be taken lightly. So he made sure he brought Flo, his pink flamingo.

They joined about 40 people crammed on a deck overlooking McMurdo Sound to tape a 15-second holiday greeting for ABC's "Good Morning America." Battaglia hopes it will be a lucky break in his quest for Fred, Flo's kidnapped plastic mate.

"Some unscrupulous person stole Fred from out in front of our campsite," explained Battaglia, a first-year electrician's apprentice who said he has spent a year and a half trying to solve the kidnapping.

A few other people wore colorful hats or

See Greeting on page 17

INSIDE

Harvesting the underside of ice

Page 7

In the spirit of the season...

Page 3 and 16

Quote of the Week

"I think if we were better adapted to our environment we'd be dumber."

— Employee comparing humans to penguins

Ross Island Chronicles

By Chico



Cold, hard facts

McMurdo shopping

Least expensive item at McMurdo store: **Bazooka bubble gum - 5 cents**

Most expensive: **Fleece vest - \$50**

Most popular gift item: **One-of-a-kind "Sweetlids" handmade hats (\$19 each)**

Estimated number of souvenir-type items sold at shop: **At least 300**

Estimated number of clothing items: **25**

Types of candy: **68**

Types of toothpaste: **6**

Busiest day this year: **Nov. 20 (\$10,370.85 in sales)**

Least busy day: **Oct. 22 (\$783.35 in sales)**

Last possible day at McMurdo or the South Pole to send a gift certificate from an online merchant to the U.S. in time for Christmas: **Dec. 26 (due to the International Date Line)**

Source: Jay Fox, retail supervisor

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Web address: www.polar.org/antsun

Katabatic Crosswords: Sorting through the types of trash

Across

1. Community trash clean-up at McMurdo
5. Stuff contaminated by bodily fluids
10. A category that requires extreme caution
12. Newspapers, posters, anything not white
16. Unbroken bottles, jars, etc.
17. Less fun than sand, but good for spreading on floors during a country swing dance
18. Saran wrap, six-pack holders, etc.
19. Leftover scraps from the kitchen

Down

2. One person's trash; another's treasure
3. Get even with these after all those crashes
4. Cans in this bin, yes; foil, no
5. Paper, foil, other "hot" items
6. Leftovers from the builders
7. Hazardous waste that includes fingernail polish
8. Just don't put your issued gear here
9. Stuff targeted by the Paperwork Reduction Act
11. Open 'em, then break 'em down
13. Includes sheet metal, but not screws
14. Shared cleaning duties at Palmer Station
15. May your Walkman's power source RIP

Solution on page 8

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



Belle (Elizabeth Shier) and Bob Cratchet (Damien Henning) embrace as Scrooge and the Ghost of Christmas Present look on, observed by director Jaime Yelvington on the couch with Drew Merritt (far left) and Dave Weimer.

Photo by Kristan Hutchison/The Antarctic Sun

Playing with traditions

McMurdo cast creates local version of the classic Christmas Carol

By Kristan Hutchison
Sun staff

Regardless of what's on the menu, there will be plenty of holiday ham on stage this year.

A cast of 20 will bring their own version of the classic Dicken's story "A Christmas Carol" to McMurdo at 2 p.m. Christmas Day.

"It's a gift to the community," said Steve Petraitis, who plays the Ghost of Christmas Present.

The actors have been rehearsing several times a week for a month in the old Mechanical Equipment Center, a partially gutted warehouse-style building scheduled for demolition. They work around the frozen puddle on one side of the room, and keep their coats on because the heat was turned off two weeks ago.

"It used to be warmer," said Jaime Yelvington, the play's director, author and producer.

The play is a credit to Yelvington's persistence, optimism and boredom.

"I was bored at work one day and I decided to put on a play," said Yelvington, administrative coordinator in the Chalet. She acted and directed a bit in high school and college.

She hung up signs seeking actors, then waited two weeks before getting a response. At the first meeting, a cast of five men showed up.

"You could see it in her eyes, 'What did I get myself into?'" Petraitis said. "But she

really took it and made something with it."

Yelvington let the actors choose their own parts and brainstorm ideas for a script.

"We started with 'What is a Christmas Carol? It's three ghosts and a transformation,'" Yelvington said. "We tried to retain that and not necessarily Tiny Tim."

Quickly they had a long list of McMurdo-based references and jokes to include. Even the ghosts have a polar theme.

Tiny Tim is gone, but his famous line remains "God bless us all, every one!" Amid the in-jokes and Antarctic references, the cast wants to spread Christmas cheer.

"I just noticed the people who I work with didn't really seem really Christmassy," Yelvington said. "I've been counting down to Christmas for 55 days and everyone was 'Humbug, humbug.'"

Yelvington took the ideas home and typed them into an hour-long play with 20 parts, trusting her ability to persuade 15 more people to join the play.

"I've been in positions before where I had to get down on my hands and knees and beg," Yelvington said.

She heard Damien Henning speaking with a mock Irish accent at a party, and asked him to be Bob Cratchet. They were well into rehearsals before Yelvington found a female lead, sending an "ambassador" to ask Elizabeth Shier to play the love Scrooge loses as he becomes a work-a-holic.

"He made it sound very low key," Shier

said. "He made it sound like 'Hey, we need a few people for the party scene.'"

Even with all the characters cast, rehearsing has been difficult. Several of the actors work night shift, and the firefighters work every other day.

The script continued to develop as the actors improvised their lines, adding even more references to McMurdo life. Zac Willette wrote himself a narrator's part in verse.

A few of the allusions are subtle, like the cigar-smoking, Scotch-drinking Scrooge, two traits Yelvington slipped in as a reference to her father, Tom Yelvington, Raytheon Polar Services Co.n program manager. He is shipping a few cigars down as props. The other props and stage pieces were found in MEC or donated by the Waste Department.

While Barb Clampet and Nancy Farrell are pulling together the most exotic costumes, all the actors are keeping their eye out for people wearing useful costume pieces, a practice they've dubbed "hostile skuaing," said Michael VanWormer.

VanWormer plays Scrooge, adding the classic miser to a list of other crochety lead roles he's played in high school and college, including Capt. Ahab and Henry Higgins.

"It was one way for me to stay in the Christmas spirit and for me to get up and entertain people," he said.

The Christmas Day performance will be a bring-your-own-beverage, pillow and blanket event in the gym.



Perspectives Perspectives

Teacher becomes student on Ice

By Eric Muhs

Back in Seattle, I told my high school students, "I'm going down to the South Pole to work on AMANDA". That got a lot of laughs. Note for physicists: when choosing acronyms for future experiments, don't use people's first names.

I came down to the Ice this year as part of the Teachers Experiencing Antarctica and the Arctic program run by the National Science Foundation.

AMANDA is the acronym for Antarctic Muon and Neutrino Detector Array. My new friend, Belgian physicist and AMANDA collaborator Phillippe Herquet, wonders why physics is so fascinated with acronyms, "These acronyms don't save any time or space. Whenever you're writing, you end (up) having to explain the acronym in a long parentheses. What's the point?"

Maybe he's right, but choosing the right acronym seems to be crucial to any modern experiment. The next big thing after AMANDA will be called ICECUBE. To my mind, that's a much better acronym, with more "street credibility" and toughness. However, like AMANDA, it creates problems when you try to find either project's Web sites. Imagine the hits you get from searching on AMANDA. Or ICECUBE.

AMANDA is a big international astrophysics project. The goal is to "catch" neutrinos from energetic events out in the universe. The technique is to melt 1.2-mile (2 km) deep holes in the South Pole ice. Then lower strings of detectors down the holes, and collect the very faint light that results from the one-in-a-trillion neutrino which makes secondary particles as it passes through the detector array. Neutrinos are very difficult to detect, as they rarely interact with ordinary matter. Trillions have passed through you since you began reading this article.

But AMANDA has found high-energy neutrino events, and demonstrated how to build a deep ice detector. ICECUBE is "Son of AMANDA." It's based on the same principles, but with refined tech-

niques based on the lessons garnered from AMANDA, and it will be much larger, encompassing a cubic kilometer of instrumented ice. ICECUBE construction is projected to begin in 2004.

This summer, I met a lot of the U.S. collaborators, including AMANDA prin-

cipal investigator Bob Morse, ICECUBE principal investigator Frances Halzen and Jim Madsen, my personal mentor and neutrino guide, all from the University of Wisconsin. Great folks all, and very committed to communicating the goals and science of the project to the greater world. That's why they brought me along.

What do you do at McMurdo for five

We all got showers and clean clothes, and everyone at McMurdo seemed friendlier to us after that.

days? Well, I got to watch the physicists fret a little. They're on a tight schedule at the Pole, with crucial calibration work to do before the next winter season begins. And now they're

behind.

We checked out Hut Point, Observation Hill and Crary Lab, flew kites and stumbled into a party at the coffeehouse for Alaskans. I also got to explain Thanksgiving and football while we ate turkey on Turkey Day.

Using my laptop, we recorded Russian and French versions of a 5-minute movie about AMANDA. And Phillippe and Christian talked about the physics experiments they'd been involved with over the years.

These are two very experienced experimental physicists. Their paths overlapped many times in Russia and Switzerland, and during the Cold War. Both had ridiculous and funny run-ins with the secret police. Their combined experience in neutrino physics is quite astonishing and it was a rare privilege to sit in the galley out on McMurdo's sea ice runway during a snowstorm flight delay. I got a two-hour presentation on the current state of neutrino experiments worldwide.

Two professors, one student (me), weak coffee — a nice morning in Antarctica.

Eric Muhs teaches physics at Roosevelt High School in Seattle. He was part of the Teachers Experiencing Antarctica and the Arctic program this year.

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Your words here
This page is reserved for columns up to 900 words by scientists and other members of the Antarctic community. E-mail submissions to antsun@usap.gov.

around the continent

SHIPS

Bumpy ride to Ross Sea

By Chris Kenry

NBP correspondent

The *Nathaniel B. Palmer's* voyage from New Zealand to the Ross Sea was at times bumpy. Shipmates came stumbling down the hall to the two main bathrooms, faces green, their hands covering their mouths. They would emerge a few minutes later looking pale and wretched.

Ah, seasickness. That aqueous misery caused by some confused little hairs in the inner ear. Little hairs that control your equilibrium, and don't know what to do when the world you're on is suddenly unstable.

Initially, when we reach open water and the boat starts pitching around I think "Wow. Fun! Just like the Tilt-A-Whirl!" But after a few hours (or on this particular cruise, weeks), the only thought is "Arrgh! Make it stop!" Imagine the worst hangover you've ever had and then imagine it not going away. For days. It's not pretty. You lose your appetite, you have a headache, your arms and legs feel leaden. The only thing you want is to lie in the dark and sleep, but even that is miserable because then your body feels like a giant Hefty Bag full of water sloshing from one side of the bunk to the other. As *N.B. Palmer* EMT Steve Tarrant put it when he gave me a transderm patch and some pills: "Seasickness is the fear you're gonna die, compounded by the fear that you're not gonna die."

The main reason for seasickness is how the inner ear reacts to the motion of the boat, but that's not the only reason. Many of the seasoned sailors (both men and women) on the *N.B. Palmer* and the *L.M. Gould* would have you believe it is also caused by testosterone deficiency. According to them it is a little girly-man sickness that real sailors don't get. And especially not in wimpy little seas like this! For that reason when people do get seasick on this boat they aren't really vocal about it. They just silently disappear, one by one. It's almost like they've been knocked off, a la Agatha Christie,

and you only notice who's missing when you rendezvous at meal time in the galley.

Now, to give honor where honor is due, the *N.B. Palmer* cannot claim the supreme title of "Poseidon of Puke." That crown goes to her smaller, bouncier, sister ship, the *L.M. Gould*, on which I have also had the pleasure of spilling my guts. Granted, the two ships have to cross the most treacherous seas in the world to reach their destinations and they do an admirable job, but that's little consolation when you're on your knees hugging the toilet.

I remember at the pier in Punta Arenas, Chile, I used to laugh at all the elderly people tottering off the behemoth cruise ships with their walkers and canes and all with little round seasickness patches stuck behind their ears. I'm not laughing anymore. Nor am I laughing when I see someone the color of Kermit the Frog come barreling down the hall to the bathroom. I'm not laughing because that just means when it's my turn and I start to lose it, I'll have to run to one of the bathrooms on the upper decks and hope that I make it in time.

On Dec. 16, the *N.B. Palmer* crossed the Antarctic circle near Cape Adare, and the seas seemed to settle, followed by the stomachs.

SOUTH POLE

Library gains history

By Anne Lewis

Pole correspondent

The South Pole library has some welcome additions. Cliff Dickey, electronics technician and team member of the U.S. Navy during the first South Pole winter in the International Geophysical year of 1956-1957, recently presented a historic photo and book to our library. The photo and book will ultimately be placed in the new elevated station when the administration and communications wing is done.

The photograph is from a slide by Dickey of the original 18-member winter crew, including both science and U.S. Navy support. The photograph was signed by those still surviving. The second addition to the library is a honeycomb book

titled "The South Pole Yearbook 1957." It is a chronology of the South Pole Station Operation Deep Freeze 1, including the autobiographies of all 18 men, historical accounts of the extraordinary efforts by those men, a summary of the South Pole science program as well as a summary of the Naval support program.

As we move toward occupancy of the third South Pole research station, these items are a timely reminder of how it all began down here at the South Pole.

We'll have plenty of time to relax in the library after our big Christmas Eve Dinner. In preparation for the meal, the community will join in pie baking and potato peeling nights. We'll kick off the holiday with the annual gift exchange on Dec. 23. Handmade knit hats and other Pole creations will be exchanged. The Race Around the World begins at 10 a.m. on Christmas Day. In this annual event, every available mode of transportation cruises around the Pole marker in loops for a total distance of three miles (5 km). The first man and woman to cross the finish line on foot are declared the winner. Last year saw some interesting entrants, though not qualified entrants, including fat tire bikes, skidoos pulling banana sleds, a van, a bulldozer pulling five pallet sleds loaded with people standing on the sled pretending to jog in place, and even a Twin Otter, which made big loops around the Pole.

While some are gearing up for the holiday at hand, South Pole science maintains its steady push forward. Installation of the trend laser receiver is complete and testing now begins for this Dark Sector science project. This latest addition to the AST/RO suite of receivers will allow astronomers to take advantage of the clearest "seeing" days occurring in mid-winter here at South Pole.

"From AASTO (Automated Astrophysical Site-Testing Observatory) to Dome C" was the title of a science lecture given by Michael Burton (UNSW) and Paolo Calisse (Viper winter crew). The lecture illustrated the similarities and differences between the astronomical potential of Dome C and the South Pole.

See Pole on page 6

the week in weather

McMurdo Station

High: 33F/0.5C Low:6F/-14C
Wind: 52 mph/83 kph
Windchill: -36F/-38C

Palmer Station

High: 41F/5C Low:27F/-3C
Wind: 71mph/114kph
Melted precipitation: 50 mm
Snowfall: 2 cm

South Pole Station

High: -16F/-27C Low:-31F/-35C
Wind: 20mph/32kph

Pole

From page 5

In addition, progress on the Italian Concordia Station was discussed, along with the potential for the first winter inhabitants there in 2004.

The drillers for Ice Core Drilling Service finished up their second hole to a depth of 980 feet (300 m), allowing the U.S. Geological Service technicians to begin installation of the borehole seismometers. Drilling began on the third and final hole this week. This hole will be used as a spare in the event of a collapse of other vertical blockage in the first two populated shafts. The first phase involves four-inch coring, followed by two stages of reaming for a final core diameter of 12 inches. The cores will be catalogued and packed up for analysis by the ITASE group.

From the South Pole, warm wishes this holiday season.

PALMER

Studying the sea

By Tom Cohenour

Palmer correspondent

The ocean does not give up its secrets easily.

An understanding of the ocean has been gained over generations, through perseverance, stamina and devotion. Some enjoy the time spent at sea and others endure the hardships of field work in exchange for the knowledge gained.

To expand the scope of existing long-term physical oceanographic observations near Palmer, an autonomous profiling vehicle was recently deployed off of Bonaparte Point. The instrument gathers data about water temperature, salinity, fluorescence and available light in a vertical



Photo by Graham Tilbury/Special to The Antarctic Sun

Kim McCoy deploys an autonomous sensor in Hero Inlet.

column of water.

These measurements expose the movement and mixing of water masses, explained oceanographer Kim McCoy and Field Support Engineer Graham Tilbury. Both men deployed the instrument as part of the Long Term Ecological Research project.

The water profile reveals the different layers of water. At the bottom is heavier water, usually cold and salty. Above, in the higher layers, the land provides some nutrients, the atmosphere provides some oxygen and the stage of life is set for reproduction.

The water profile measurements support long-term physical and biologically important observations related to coastal and near-shore dynamics. Radio transmitters on the instruments make it easier to establish the location and retrieve the data.

The sea and land are at battle in the coastal zone. It is an ideal location to observe the ocean's internal waves dissipate energy within shoaling waters. Antarctic researchers are attempting to collect a year's worth of vertical profile data. After the first few phases of the moon, the ocean's complex structure will become evident. This will produce a long-term data record from

an under-sampled environment.

The autonomous instrument transports sensors vertically through the water column, usually starting within a meter from the bottom and continuing to the surface. Typical profiles are separated by one-hour intervals during which the instrument remained near the bottom. The sample rates are at one sample per second (1 Hz) during profile segments and one minute during the bottom intervals.

Implementing an instrument mooring that could survive brash ice and small bergs was a challenge. They first had to identify locations where there are few large icebergs likely to knock it out.

By all accounts the profiling was a success. The autonomous profiling vehicle completed more than 700 profiles traveling from the ocean surface to depths of 180 ft. (55 m) between one and three times per hour.

Initial data indicate a tidally forced thermal signature in the bottom boundary layer. During periods of strong stratification, internal wave propagation may be inferred in some of the data sets. These are the first significant efforts to correlate physical data of this type from the Palmer area. Historically, Palmer data sets have been biased toward the collection of biological information.

It is a long-term goal of the LTER is to expand the amount of biologically significant physical oceanographic data. Several candidate sites are being identified where long-term autonomous profiling vehicles and acoustic doppler current profilers could be deployed. Deployment in water deeper than 330 ft (100 m) is desirable. Surveys of the ocean depths of outlying areas have been undertaken and need to be expanded.

Continental Drift

What would be the most useless gift you could receive in Antarctica?



“Probably quinine pills or antivenom — anything else here would either get used or reincarnated.”

Emily Lindsey
Palmer volunteer with
LTER from Portland,
Ore.



“A renewal to the National Association of Nude Recreation.”

Dennis Calhoun
South Pole heavy
mechanic from Rapid
City, Mich.



“Maybe a recipe book for fresh vegetables or hedgetrimmers or cat food.”

Rhoda Bonneau
McMurdo fuels
coordinator from
Sheridan, Wyo.

Ice may hold anti-freezing secrets

By Mark Sabbatini
Sun staff

The idea of using fish parts to improve everything from ice cream to cell tissues has been pursued for years. Now James Raymond is hoping for similar results using algae found in Antarctic sea ice.

The algae and certain types of fish in Antarctic waters produce proteins that offer protection from the freezing conditions. There are significant differences between the two, but Raymond said the algae byproducts are much easier to obtain and may some day be useful for protecting things such as food and blood cells from the adverse effects of freezing.

“An often-heard suggestion for ice-binding molecules like fish antifreezes is to use them for keeping ice cream creamy,” said the biology research professor from the University of Nevada Las Vegas’ Department of Biological Science. “When ice cream sits in the freezer for a long time the little crystals fuse into big crystals, which aren’t very appetizing.”

It’s possible the molecules could be used to improve other consumer products that now have “do not freeze” labels on them, ranging from mayonnaise to paint.

“During the freezing process you get separations,” he said. “If you can prevent that separation from occurring during the freezing process you have something that can be handled much more cheaply.”

The potential of the algae byproducts is “pure speculation at this point,” Raymond said. He is spending several weeks this

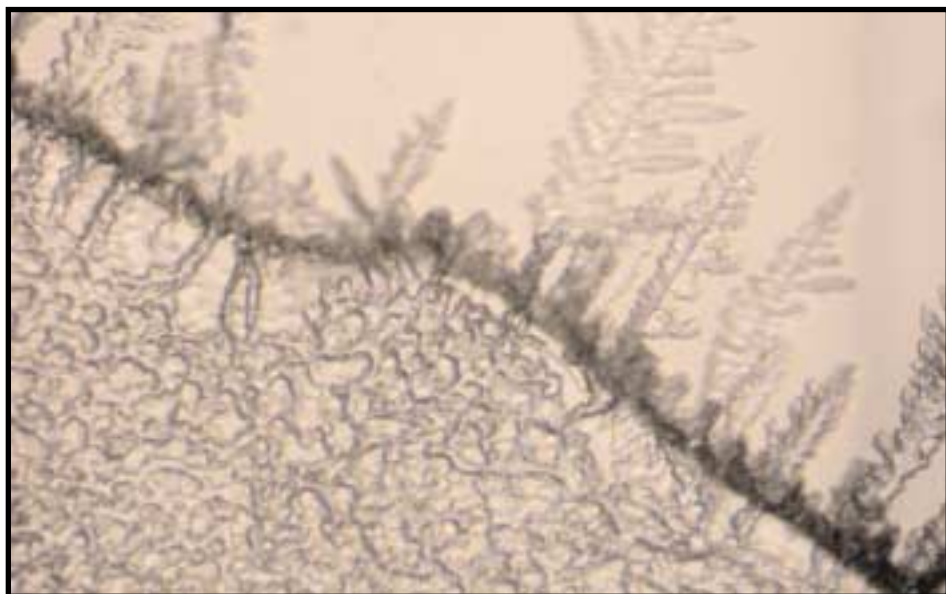


Photo courtesy of James Raymond/Special to The Antarctic Sun

A microscopic image of the sea ice diatom algae James Raymond is studying.

season at McMurdo Station gathering and analyzing the byproducts, known as ice-active substances (IASs), which are produced by a class of algae known as sea ice diatoms.

“You really can’t kill millions of fish to get the antifreeze,” he said. “With the ice diatoms you have the ability to grow them in mass cultures in unlimited amounts. If an application is found, it’s reasonable to expect that large amounts could be produced.”

Antifreeze proteins protect fish by low-

ering the temperature at which they will freeze in the presence of ice, according to Art DeVries, a biologist who has spent more than 40 years studying Antarctic sea life. The proteins in the diatoms have a different function.

“The IASs do not substantially lower the freezing point, but still absorb to ice and alter the surface of growing ice crystals,” DeVries wrote in an e-mail. “Their function is probably to make diatoms stick to the ice surfaces where there is more sunlight than on the bottom.”

Or, as Raymond puts it, “the IASs don’t actually try to prevent the freezing, but they try to minimize the damage when the freezing does occur.” In addition, “they may protect cell membranes from damage during freezing, so there’s a hope they might be useful for preserving cells and tissues.”

Another important difference, according to Raymond: While researchers have been studying the potential of fish proteins since the 1970s, pure molecules from the IASs have been available only for the past year or so. As a result, much less is known about them.

The diatoms appear as dark spots and are distributed widely in thinner layers of sea ice where the sun is able to penetrate. The IASs are mostly found in Antarctic waters, reaching their highest concentrations in November and December, but Raymond noted a sample has been found in Arctic waters near Resolute, Canada.

Getting the diatoms from the ice at various sites near McMurdo requires help



Photo by Mark Sabbatini/The Antarctic Sun

James Raymond, right, scoops up algae-rich sea ice samples as a large drill, shown at left, extracts a heavy flow of ice and water as it rises to the surface.

See Ice secrets on page 8

Ice secrets From page 7

from station workers who use a large-truck mounted drill to bore through the surface ice. The drill is then raised slowly, bringing a rush of sea water and sea ice chunks with it.

Raymond and his two assistants, post-doctoral student Mike Kuiper and graduate student Mike Janech, then collect the diatoms before the ice crystals they are attached to can melt. Raymond said there are a number of different species of diatoms in the waters, each of which appears to have ice-binding molecules, but he tries to seek out samples where only one species is present so a better analysis of each is possible.

The researchers then test the ability of the IASs to protect the sea ice diatoms from cell damage. Some of the work is occurring at McMurdo and will continue when they leave the Ice.



Photo by Mark Sabbatini/The Antarctic Sun

Graduate student Mike Janech breaks up pieces of sea ice near McMurdo Station.

“We’re going to subject the cells to freezing and thawing, and then look at their viability, or their health, to take up carbons through photosynthesis,” Raymond said. “The plants use CO₂ for photosynthesis. We’ll use that uptake to determine how well they survive.”

“The other main goal is to purify these molecules and characterize them and find out exactly what they are,” he said.

A new technique will be attempted when purifying the molecules by freezing them very slowly, Raymond said. He said impurities tend to be pushed away as water freezes, and hopes slowing the process will drive more of the foreign substances out.

The IASs are made up of a combination of proteins and carbohydrates, which may provide protection for the diatoms by binding to the ice crystals. But their makeup, in addition to differing in function from fish antifreezes, also make some lab work more difficult, Raymond said.

“It’s more difficult to purify them than fish antifreeze because (the IASs) have a huge amount of carbohydrates,” he said.

Molecules with carbohydrates suffer from, in the simplest of terms, an attachment problem, DeVries noted.

“For the antifreeze glycoproteins which have sugar side chains, one can make them by synthetic chemistry, but it is costly and the yield is low,” he wrote. “Microorganisms can’t be used to make them because they cannot attach the sugars. Yeast, however, can, but it is not yet known how to control the attachment of the specific sugars, galactose and galactosamine. Thus the fish know something the scientists don’t know.”

Raymond said he plans to work at McMurdo until mid-January before



Photo courtesy of James Raymond

Mike Janech analyzes sea ice diatoms in a lab at McMurdo Station.

returning to the U.S. to continue his research. He said he hopes to learn within a couple of years whether at least some of the potential applications for the antifreeze proteins are possible, but it will take longer than that to evaluate all possibilities.

“Not that much has been tried with them,” he said. “So far I think I’m the only one who’s been looking at them.”

A presentation by Raymond about his study is scheduled at 8:15 p.m. today in the McMurdo dining hall.



Thank you to all who entered the Antarctic Photo and Writing contest.

We received more than 100 entries
The judges are hard at work
and will present the winners in
The Antarctic Sun next week.



Find the photo you wished you’d taken at photo.library.polar.org

Family and friends want to learn more about the Ice?
Send them to *The Antarctic Sun*
www.polar.org/antsun



A skua, left, circles over the penguin colony at Cape Royds. The colony has been shrinking in the last two years as extensive sea ice puts the penguins hatching grounds further from the water.

Making of a ghost colony

Cape Royds penguins losing battle against sea ice and skua

Photos and story by Melanie Conner

Adelie penguins pepper the dark hillside of Cape Royds like smooth, oval black rocks as they lie on their bellies under the 24-hour Antarctic sun. On his stomach, a penguin lies in a pebble-lined nest, incubating the egg beneath him. Hungry skuas circle above, waiting for him or any bird to move slightly, exposing an egg just enough for it to get snatched.

A skua descends and lands amidst a cluster of penguins, pecking and squawking at them in an attempt to intimidate penguins into leaving their eggs.

Hungry, because his mate should have relieved him from nest duty 10 days ago, tempted by the idea of food in the distant sea and tired of the tormenting skuas, the penguin loses hope that his mate will soon return. He heads to the sea for food, leaving his only egg for skuas to eat and his space inside a penguin cluster for skuas to occupy.

“That never used to happen,” said David Ainley, of H.T. Harvey & Associates, ecological consultants based in San Jose, Calif. “The nests used to be thick enough that if a skua dared land in there, the penguins would not allow it.”

The sparsely populated penguin colony is a result of the increased extent of sea ice, which impacts the penguins’ ability to breed and feed normally.

For the second year in a row at Cape Royds, the amount of sea ice has increased the distance between the colony and open water, where penguins forage for krill and fish. Open water located 26 miles (42 km) away and a penguin walking speed of only about 0.5 miles (1 to 2 km) per hour add a critical two days to the journey between the nests and food. After reaching open water, penguins then have to find food and feast long enough to regain their weight after three to four weeks of fasting, before returning to the colony.

Normally, the birds migrate to their breeding grounds on shore from the pack ice in the eastern Ross Sea. At the colony, the female penguin lays an egg in a pebble-lined nest, then travels back to the sea for food while her mate incubates the egg. The male penguin stays with the egg until the female returns and relieves him in



A penguin stretches and repositions, making its egg momentarily vulnerable to skuas.

See Colony on page 10



A skua tries to chase a penguin away from its egg at Cape Royds. Below, the penguins huddle over their eggs in nests built from pebbles and rocks. The nests are more widely spaced this year because the colony has been shrinking, leaving room for the skuas to land in their midst.

Colony From page 9

just a few days. But for the second year in a row, incubating birds at Cape Royds are leaving their nests after becoming hungry and impatient. If the foraging bird returns at all, it often finds its mate gone and the nest empty.

At the end of the laying season on Nov. 20 of this year, there were 3,800 nests with eggs. Now there are 1,200, leaving just over 30 percent left to potentially produce chicks. This is a significant loss in comparison to 2000, the last year of “normal” ice conditions, when the number of eggs dropped only from 3,800 to 3,620.

With the peak-hatch period expected to take place around Christmas this year, and the number of eggs decreasing at a rate of 7 percent a day, it is not likely that chicks will be produced this year, Ainley said. However, the incoming U.S. Coast Guard icebreaker or strong southerly winds could bring open water closer to penguins.

“We’re in a big race now between hunger and how fast the icebreaker can get here and do it’s thing,” said Ainley. “Although it’s coming to save McMurdo, not penguins.”

Ultimately the icebreaker can’t really save the chicks, because they are hatching so late this year. There is almost no chance they will survive with the onset of winter, added Ainley.

Despite the grim outlook, surprises are not unheard of. Last year, Mother Nature



smiled upon Royds penguins, and on Dec. 14, 2001, she delivered a four-day, mid-December storm. The strong katabatic winds blew enough sea ice out to shorten the journeys for foraging parents, just as the eggs were beginning to hatch.

“The storm saved the efforts of a few Cape Royds birds last year,” said Ainley, who had predicted seven days earlier that the Royds Colony would “fail totally.”

Instead of failing, the storm allowed the colony to produce 200 chicks, compared to the usual 4,000 chicks.

Although the colony has not yet failed, researchers are learning that the process is underway because older birds are dying and are not being replaced by young birds. Cape Royds is not producing chicks and previous chicks are not returning there to breed.

Of the chicks produced before the 2001-02 season, it is doubtful they will return to Royds after spending many formative years at sea. Deserted by the young, Cape Royds is increasingly

See Colony on page 11



A lone penguin makes the long walk from his nest at Cape Royds to the sea, abandoning his egg in search of food.

Colony From page 10

becoming a penguin ghost town.

"There is nothing going on at Royds anymore, the new birds don't want to be there," said Ainley. "It's just like a teenager who would rather go downtown than stay at the farm. The exciting places are attracting new recruits."

But the young penguins' pursuit of active colonies is not all that easy. While they may be assuring their reproductive future by not returning to Cape Royds, they are overcrowding penguins in other areas, such as Beaufort Island, the colony closest to the ice edge. With over 50,000 pairs, and the influx of young penguins, Beaufort Island is facing overpopulation.

"Beaufort Island has had an injection of activities. It has reached its space limit," said Ainley. "There are penguins everywhere. (The island) is brimming over with penguins."

As a result, the wayward Royds birds are showing up at Cape Bird and Cape Crozier, both of which still have plenty of space. The researchers know this because they've banded chicks at all the colonies over the past eight years.

In what appears to be a transition from one colony to another, Ainley and his colleagues are more excited about the possibility of witnessing penguin responses to extended sea ice conditions and climate change.

"What is going on in the McMurdo Sound area is showing how sensitive they are to conditions of sea ice. They had already been colonizing new areas that were becoming ice-free," said Ainley.

By tracking the birds' movements, using satellite telemetry and banding, the information could ultimately provide insight into the biology, resilience and resilience of these birds.

"The system is showing us how sensitive penguins are to climate change," said Ainley. "We thought that they had a really highly developed sense of philopatry, or

faithfulness to their place of hatching. We thought the formation of new colonies was not all that easy. But their sense of where they were born isn't as strong as we thought. They've been quick to abandon Royds."

Hopeful that current penguin trends will allow him to study the past, Ainley described information on extinct colonies, such as ones at Cape Barne and Marble Point, as "abstract and hypothetical."

Now we are witnessing the process first hand," said Ainley, "It is driving home lessons about how wild creatures respond to the forces of nature."



The shell of a recently devoured penguin egg is a sign of the shrinking colony at Cape Royds.



Photos courtesy of Randall Davis
A sign, above, greets those arriving at camp as researchers on the sea ice, right, use a net to capture a Weddell seal that will be outfitted with a camera.

Weddell From page 1

spent hunting and traveling hundreds of meters deep under the sea ice, holding their breath for as long as 80 minutes at a time as they exert themselves.

“Our question is how the heck are they doing it?” she said. “How can they save energy by being a predator?”

Research at Weddell World revealed plenty of answers, such as the seals’ ability to save energy by diving with little exertion. But plenty of questions remain when project members, who departed Antarctica earlier this month and are spending next year off the Ice, seek to return in 2004.

Randall Davis, the project’s lead investigator, said one of his main goals is to study how seals hunt in dark conditions, either during the winter or under thick sea ice.

“We think vision is important when ambient light levels are fairly high,” the marine biology professor from Texas A&M University said. “Might there be other sensory systems coming in, even when ambient light is high, that we don’t know about?”

Going out strong

This season the team doubled its video data from last year, witnessed the limits of a seal’s eating ability and got a solid read on the role of blubber. One might say they were in Fat City – if that wasn’t the name of a nearby camp conducting research on the digestive process of the mammals.

The home of Weddell World this year was near Tent Island, about 10 miles (16km) north of McMurdo. Finding openings in the ice where seals had surfaced

proved to be somewhat of a challenge.

“We were surprised at how ‘tight’ (lack of natural cracks) the ice was,” noted Shane Kanatous, a University of Texas Southwestern Medical Center researcher working on a separate project at the camp, in a journal documenting the season. “It turns out not all of the ice in the sound broke out last year.”

The main building for the camp was a 136-foot (42m) Jamesway shelter, the largest such structure used by any of the remote camps in the U.S. Antarctic Program. Rooms included a kitchen, separate sleeping areas for men and women, and a lab filled with technical equipment and computers linked by satellite to the Internet. At one end was an observation room where a hole was drilled into the sea ice, allowing seals to surface for air and researchers to place in Weddells they caught to observe their behavior.

Weddell World researchers spent the past two seasons observing seals in a free-ranging environment, attaching cameras to them at the camp and allowing the mammals to swim to whatever holes they might choose. The first three seasons their habits were studied in a more restricted environment, with camps located at isolated ice holes too far away from other holes for the seals to reach.

“The seal was able to dive as deep and as long as it wanted to, but it still had to come back to this location,” Davis said.

The free-ranging sites allowed researchers to observe more natural behavior, but also meant more risk and uncertainty after attaching the cameras

and other equipment – worth about \$25,000 – to the seals.

“This was a big step for us because we essentially were going to give up any control we had of the animals,” Davis said. But he said the chances of losing track of the animals was relatively small as long as the equipment worked, since satellite and VHF radio signals broadcast the seals’ location when they returned to the surface.

Researchers used nets to capture seals on the ice surface – preferably non-pregnant females, who tend to be more docile than males. The seals were then brought by sled to the Jamesway shelter at Weddell World, mildly sedated and hooked up to the cameras.

In earlier years it wasn’t always easy to catch the seals, which can reach lengths of nearly 10 feet (3m) and weigh up to 1,100 lbs. (550kg).

“We all got whacked by the fins or the back end because we were looking at the head thinking that was the dangerous part,” Williams said.

Experience with the animals and the latest in modern technology played a large role in this season’s success.

Cameras attached to seven seals provided about 100 hours of underwater video this season, Davis said. He said in past years a camera would be deployed on a seal only once, while this year they filmed each seal two to six times.

“What we were trying to do this year especially was to get an adequate sample size,” he said. “The way to do that is to log lots of underwater time, as much as we

Weddell

From page 12

can.”

Researchers have studied the diving and hunting behavior of seals since the 1960s, primarily using depth and time recorders. But the cameras used at Weddell World proved to be a breakthrough.

The 8mm computer-controlled cameras automatically turned on when a seal dove more than 160 feet (50m) deep and switched off when the mammal spent more than 10 minutes on the surface.

Up to six hours of video could be recorded at a time on digital memory cards at depths of nearly 4,000 feet (1,000m). Other sensors provided continuous data about the seal's depth, speed, compass bearing, water temperature and flipper frequency, plus sound from the dives. Illumination for the black and white videos came from infrared lights.

“The infrared is invisible to the seals and their prey, so we're not altering their behavior,” Davis said.

The primary prey for the seals are small silverfish eaten by the dozen and larger toothfish up to six feet (1.8 m) long which may take three hours to consume. More than 1,000 captures were recorded during the five-year study, allowing researchers to generate three-dimensional maps revealing hunting strategies, sensing abilities and other aspects of seal life not possible with previous data recorders.

One map shows a seal making a slow, gradual descent for about four minutes, then changing speed abruptly at about 1,300 feet (400m) in depth and turning to the right, somewhat away from a toothfish being pursued. The seal then drops two meters below the fish and attacks it from below.

The camera mounted on the seal's forehead allows viewers to see the struggle as it grabs the toothfish by the upper jaw, but “in the end the fish gets away in this case,” Davis said.

The depth the seals hunted at varied by about 390 feet (100m) by the time of day, apparently due to variations in light intensity, said Lee Fuiman, a professor at the University of Texas who was the third principal investigator at Weddell World.

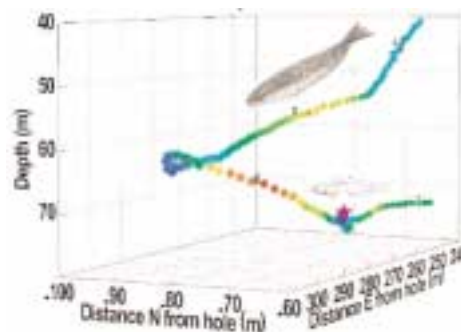
Generally the captures occurred at 650 to 1,300 feet (200 to 400m) below the sur-

face, but some prey were found at unexpected depths, he said. Previous research by others indicated toothfish would be found below 980 feet (300 m), for example, but “of the 26 encounters we had, only one was below 300 meters.”

It typically takes less than one-third of a second for a seal to catch a silverfish, so those videos need to be analyzed frame by frame, Davis said. He said they learned seals generally eat about 20 silverfish at a time, take a few breaths, then go back down. A seal that ate 30 in one dive appar-



A Weddell seal, above, with a head-mounted video camera feeds on a toothfish. The chart below shows how the seals' are tracked.



ently exceeded its limits, regurgitating the meal at the surface.

“We don't know the reason, but there does seem to be some limit there,” he said.

Energy conservation

All those fish add up to a lot of calories – exactly how many is a topic of future study – but it takes a lot to spend hours hunting and swimming in frigid waters. At the same time, the seals also have to make the most of the oxygen in their system as they spend extended amounts of time

under water.

Figuring out how the seals maximized their energy resources has been the main focus of Williams' work at Weddell World. Among the discoveries she's made is the seals can save anywhere from 10 percent to 50 percent of their oxygen reserves by essentially sinking, rather than swimming, when they descend beneath the surface.

“They don't need to stroke every time on the descent,” she said.

Digesting their chilled prey requires up to 45 percent more energy than a seal who isn't feeding, however, and that extra need for oxygen can last nearly five hours, Williams said. That cuts down drastically on the distance they can swim before they need more oxygen.

“The problem is Weddells don't always have access to air, so we will be looking at their strategies,” she said.

She said seals need to start making a decision about where they intend to surface after about 20 minutes. That gives them enough time to return to their point of origin, if necessary, and alert others who may be competing for the air hole.

“They start to vocalize, warning the others they are coming up and need to take a breath,” she said. Other seals don't always get out of the way, however, and “sometimes it gets a little rough.”

Energy usage is also a concern on the surface. Williams said researchers brought a portable ultrasound machine to Weddell World this year to analyze skin, blubber and fat, with the blubber layer on one seal measuring 2.6 inches (6.71cm).

Infrared camera readings show a wide variety in body areas where seals lost and retained the most body heat, despite their coating of blubber. Baby seals, who struggle to survive for a number of reasons, have very little ability to retain warmth. Mature seals lose a considerable amount of heat while sunbathing, but for a different reason.

“The seals have to lose excess heat or they would boil in their own insulation,” Williams said.

One remaining mystery is how their

See Weddell on page 14



Lee Fuiman, right, and Kate Willis, center, work inside the Jamesway that houses researchers at Weddell World. It is the largest such shelter of any of the remote camps in the U.S. Antarctic Program.

Weddell From page 13

racquetball-size eyes stay warm when diving, Williams said. She said high blood-flow in the membrane in the lower part of eye may allow it to retain heat.

Sounds from the Sound

The sights at Weddell World may be impressive, but the sounds at times are absolutely mind-blowing.

The seals perform social, courting and competitive calls at volumes as high as 178 decibels – or about 60 decibels higher than an eardrum-shattering rock concert. Jesse Purdy, a professor from Southwestern University, said Weddell seals have 12 calls with 34 different types of acoustic variations such as pitch, repetition and harmonics. A tape of the seals contains sounds from high-pitched trills to deep thuds that have the rhythm and tone of a bass drum track on a dance club song.

This season's goal was to find a male seal who would defend the hole and attract females, Purdy said. Within 10 minutes of drilling the hole at the Jamesway, a male who would be nicknamed "Pink 841" surfaced and made his claim to the territory.

Purdy and the other researchers introduced five male seals and nine females into the hole during the season. The interactions with other males were generally competitive, but Pink 841 held his ground.

"You're going to be hearing a large number of jaw claps and thumping sounds," Purdy said at the beginning of a taped segment featuring the males.

"These bites don't sound too bad until you see the animals on the surface and then you realize the game is being played very seriously," he added, noting some animals had significant flesh wounds.

Interactions with females typically contained a much larger number of chirps and there was a greater willingness of Pink 841 to allow them to surface, Purdy said. The seal proved to be an attractive lure for females, at one point courting three of them at one time.

The sound studies have taken place during the past two years. Davis said the seals may have the ability to hear noises over a six-mile (10km) area, in essence turning the local waters into "a massive party line."

"Much of McMurdo Sound may be audible to these seals," he said. "That's something we haven't even begun to explore or understand."

Muscle mania and Fat City

Three other projects involving the study of Weddell seals are taking place in the McMurdo region this year. One is an ongoing long-term effort to record the population dynamics of the area, while the other two involve shorter term research at or near Weddell World that could result in medical findings beneficial to humans.

Kanatos, the University of Texas Southwestern Medical Center professor, is studying the skeletal muscle development of young seals in an effort to learn how the

muscles end up highly resilient to low oxygen levels.

"That takes them from land mammals that can't dive to one of the elite diving mammals of the world," he said.

His work on the Ice involved collecting muscle biopsy samples from newly weaned pups five to seven weeks old and adult seals. He will use the samples to test the theory that seals begin developing the necessary muscle structure while nursing and continue to develop as they learn to dive.

The muscles may not develop completely until they are several years old, however, meaning they can't dive as deep for prey as adults, he said.

Kanatos is also studying the seals' genetic regulation of myoglobin, a highly concentrated hemeprotein. He said learning how seals maintain a normal aerobic metabolism in conditions that are lethal to many animals, including humans, may help lead to the development of muscle protections that could aid in the treatment of ailments such as heart failure.

While Weddell World researchers spent much of the season learning how seals catch their prey, Michael Castellini was a few miles away studying the next step.

"They were looking at how animals caught the fish," the University of Alaska Fairbanks professor said. "We were looking at how do they process it?"

Observing how seals utilize the marine

See Weddell on page 15

The science of art: Another way to look at seals

By Kristan Hutchison

Sun staff

While the scientists at Weddell World observed the seals, artist Bob Marstall was observing them both. The researchers reminded him of the fable about five blind men trying to understand an elephant by each examining a small part – the side, the tail, a tusk, an ear, the trunk, a leg. Like the blind men, the researchers each focus on some aspect of seal biology or physiology.

“There are several scientists with different angles all looking at different aspects of the animal. All of those aspects add up to the total package,” Marstall said. “What Larry and I are doing will add to that.”

Sometimes it takes an outside observer, like an artist, writer or generalist scientist, to see the animal as a whole. Marstall looks at the seals as an artist, trying to transfer the living, breathing animal to an illustration. He and Laurence Pringle have a National Science Foundation Artists’ and Writers’ grant to research a nonfiction children’s book on Weddell seals, the fifth such book the illustrator/author team have collaborated on, including *An Extraordinary Life: The Story of a Monarch Butterfly*, which won the Orbis Pictus Award for nonfiction.

Unfortunately Pringle, who originally thought of applying for the NSF grant and asked Marstall to join him, wasn’t able to come to Antarctica at the last minute, so Marstall came alone.

Marstall’s way of approaching art is similar to a natural scientist, and he sees art and science as closely entwined.

“The relationship between art and science is actually of great interest to me,” Marstall said. “At its purest level, good art and good science are two sides of the same coin.”

Both artists and scientists must be creative, looking at the subject of their study in new and different ways, Marstall said.

Both are trying to figure out something about life and what makes it work.

“They (artists and scientists) are both observing nature,” Marstall said. “It’s what they do with that information that is different.”

Sometimes the boundaries between art and science grow fuzzy. Was Leonardo DaVinci an artist or a scientist when he sketched the human body?

Pencil sketching is a traditional technique in science, not only as a record, but also as a tool for seeing more clearly. Having to draw something focuses the mind on the details and structure, Marstall said.

“There’s this big jump in your ability to see and understand what you’re seeing when you draw. There’s a physical connection between the hand and the eye.”

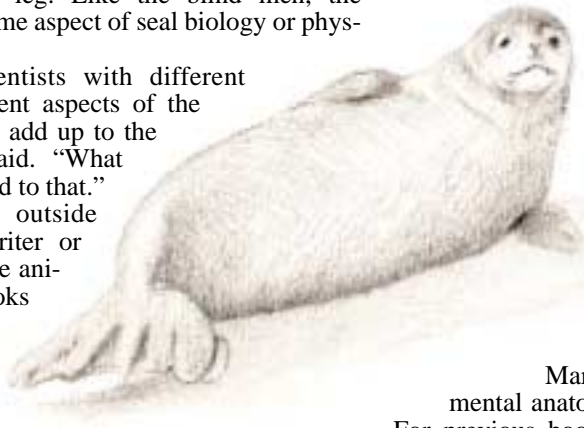
At the same time, as an artist,

Marstall must understand much of the fundamental anatomy and biology of whatever he is drawing. For previous books, Marstall has collected dragonfly eggs, examined dragonfly jaws under a microscope, and raised hundreds of monarch butterflies in his studio.

“I do that with every book,” Marstall said. “I work from the inside out. To get the details right, you have to understand the structure, the underlying structure.”

Marstall spent most of his time with the seal researchers taking photographs, which will prompt his memory as he draws and paints seals back in his studio in Northampton, Mass. His richly detailed watercolor and oil paintings bring his subjects back to life on the page, reflecting the depth of his understanding for the subject. As an artist, his experience is very much like the researchers who find that every answer leads them to ask more questions and discover more areas of study.

“It’s certainly true with artists, the more you look at something the more you see. That’s what keeps it interesting,” Marstall said. “I’m never ever bored.”



One of Bob Marstall's preliminary seal sketches.

Weddell From page 14

lipids in their prey, which are rich in omega 3 fatty acids, may provide clues to how humans benefit from consumption of the same lipids, Castellini said. He noted Eskimos and Natives in Alaska traditionally ate a high-fat diet consisting of animals caught in the area, but their health has declined during the past 60 years as Western influence has replaced those items with other fats.

This is the first year of his study. Castellini says he will do most of the analysis on lipid samples he has collected from seals once he is off the Ice, and he will return next year to take different measurements, such as how fast the seals can

absorb the lipids.

The long-term population study has been led by Don Siniff of the University of Minnesota, with more than 80 percent of the seals born in the region identified and tagged during the past 30 years. The project’s principal investigator this season is Bob Garrott of Montana State University. Although the group was not directly involved in Weddell World, they did provide some advice, such as telling Kanatous where juvenile seals were likely to be found.

Future years will try to expand on what the Weddell World researchers have discovered. Equipment is also likely to improve:

Davis said a next-generation video camera set to debut in a year-and-a-half will be half the size of the ones used now.

Some of the future research is likely to go beyond feeding habits, Fuiman said.

“We’re pretty confident we know what a foraging dive is,” he said. “The challenge is now figuring out what those other dives are for.”

The research was also useful in gathering more information than expected about how the prey of seals live. But Williams said there may also be some interest in focusing more effort on creatures other than seals.

“I think all of us are saying ‘We’ve got

Ghost of Antarctic Christmases past

It is amazing how Christmas comes, even here in Antarctica. A hundred years ago three men were alone in this cold desert, following a compass point as if it were a star. Scott, Wilson and Shackleton struggled to pull 170 lbs. each across the plateau on meager rations of pemmican, biscuit, seal meat and hoosh.

"It is not enough, and hunger is gripping us very tightly," Scott wrote in his journal on Dec. 22, 1902. "I never knew what it was like before, and I shall not be particularly keen on trying it again."

The dogs that were left were too weak to pull, and the men themselves weren't much better. Already Wilson had found signs of scurvy in Shackleton's "angry-looking gums" and all three of them suffered bouts of snow-blindness. Their nostrils, lips and fingers were chapped and cracked.

"But all our ailments together are as nothing beside our hunger, which gets steadily worse day by day," Scott wrote Dec. 23.

It was not the white Christmas we dream of, with glistening tree tops and sleighbells ringing. Sleds aren't as fun when you're the horse.

"Tonight is Christmas Eve," Scott wrote. "We have been thinking and talking about the folk at home, and also much about our plans for tomorrow."

Plans for tomorrow? What kind of sugar-plum dreams could these starving men have? If they hung their stockings they'd just frostbite their feet.

But somehow Christmas came, without ribbons, without tags. It came without packages, boxes or bags...

"For a week we have looked forward to this day with childish delight," Scott wrote on Christmas. "When we awoke to wish each other 'A merry Christmas' the sun was shining warmly through our green canvas roof. We were outside in a twinkling, to find the sky gloriously clear and bright, with not a single cloud in its vast arch. Away to the westward stretched the long line of gleaming coastline; the sunlight danced and sparkled in the snow beneath our feet, and not a breath of wind disturbed the serenity of the scene. It was a glorious morning, but we did not stay to contemplate it, for we had even more interesting facts to occupy us, and were soon inside the tent sniffing at the savoury steam of the cooking-pot."

They feasted all day.

For breakfast each had a pan full of biscuit and seal liver, fried in bacon and pemmican fat, followed by a large spoonful of jam, which "left a sense of comfort which we had not experienced for weeks, and we started to pack up in a frame of mind that was wholly joyful."

That day they found their burdens lighter, the snow firmer, their steps easier. With a break for lunch – hot cocoa, a whole biscuit and again jam – they covered nearly 11 miles. Then they indulged in a "Christmas wash and brush-up" before laying into a Christmas stew, with a double serving of everything.

"Meanwhile I had observed Shackleton ferreting about in his bundle, out of which he presently produced a spare sock, and stowed away in the toe of that sock was a small round object about the size of a cricket ball, which when brought to light, proved to be a noble 'plum-pudding.' Another dive into his lucky-bag and out came a crumpled piece of artificial holly. Heated in the cocoa, our plum-pudding was soon steaming hot, and stood on the cooker-lid crowned with its decoration."

The men spoke of home and friends, not wistfully, but gaily. They wondered if Christmas back in England could have possibly been any better than theirs. And as Scott smoked his second pipe he wrote "for us this has been the reddest of all red-letter days."

We at *The Antarctic Sun* can only wish that your holidays are as merry as their's was.

An Onset D Christmas

By Doug Ruuska

Out to the cargo line, in our festive best,
Parkas, large shoes, and polka-dot vests.

There to chop out a tree from the stacked plywood forest,

The spirit of Yule made our tree not the poorest.

A silence lay on the flat, white Christmas land,

Broken only by chainsaws of our merry band.

With hands full of Sharpies we decorated with care,

Hoping our senses to fool with thin air.

On came the 931 with a clatter and

Off jumped our cook with a bowl full of batter.

A Christmas you want, a Christmas you'll have

Off she went to the stove, our spirits to salve.

After a big Christmas meal that couldn't be beat,

We all had another and agreed it was neat.

We hung up our stockings over the Preway with care,

And hoped by the morning they'd be dried by hot air.

Ken Borek Air was all snug in their beds,

AN8 fume—induced visions danced in their heads.

My hot water bottle & I had just gone to bed,

When the roof of the Jamesway groaned with great dread.

From the weight of the Nansen sled teamed by Adelies,

Loaded with Anti-Claus and gifts made in New Delhi.

I went to the Preway to check on the heating,

Whence from within there came this odd greeting.

"You there," he said, "why are you awake?"

"You should be abed, dreaming of steak!"

Dressed all in green, trimmed with black fur,

He slapped his great bulk and shouted out

"BRRRRRR!"

He came and he laughed at our miserable tree,

"It's the thought that does count," and he laughed

"tee hee hee."

He left us some gifts, fresh onions and whiskey,

And with a puff of smoke he was off up the chimney.

His troupe silhouetted by a full midnight sun,

I heard him cry out in a voice filled with fun.

"A polar Christmas to all,

And to all a bright night."

Doug Ruuska is a meteorological technician at Onset D field camp on the West Antarctic plateau.



“They’re looking for something different or unique. My guess is we’ll fit.”

— Dave Bresnahan, NSF representative

Greetings From page 1

items of clothing, but most were content to be part of the sea of standard-issue red parkas gathered outside of the Chalet administration building at McMurdo Station on the windy afternoon of Dec. 15. They spent about half an hour recording several takes of the greeting, similar to messages being recorded by U.S. personnel worldwide for ABC’s morning news show.

There is no guarantee “Good Morning America” will air McMurdo’s greeting, said David Bresnahan, the National Science Foundation’s representative at McMurdo, during a pre-tape briefing. But he said his gut feeling is there’s a good chance it will appear sometime during the holidays.

“They’re looking for something different or unique,” he said. “My guess is we’ll fit.”

The McMurdo script called for a close-up shot of Bresnahan welcoming viewers and passing on a brief greeting to his wife Carolyn and their daughters Megan and Briana. The camera would then pull back and everyone would say “Happy holidays and Good Morning America!”

The first time the group tried the line, from the warmth of their chairs inside the Chalet, it sounded rather tentative. Bresnahan told them they’d

need to do better once they got outside.

“If we don’t do the ‘Good Morning America’ with enthusiasm they’re not going to play the clip,” he said.

Once outside, a few members hoisted the Chalet’s collection of international flags as McMurdo Broadcast Technician Eric Sturm set the greeters up (“If you’re tall, stand in the back; if you’re short, stand in front.”). Battaglia made sure he and Flo were kneeling near the front. Then it was time to shoot and shout.

Bresnahan delivered his opening and the group chimed in its greeting with all the enthusiasm one could hope for – a little too soon. The encore, with the aid of a hand signal from Sturm, went smoother. A third take for safety’s sake was shot and the gatherers were allowed to scatter, wondering when the segment might air and who might recognize them.

“My mother watches ‘Good Morning America,’” said Kerry “Summer” Snow, a second-year science cargo worker from Chicago who was wearing an “alternative Santa hat” made by her mother featuring purple and leopard spots. “She would be very surprised to turn on the TV and (see us).”

McMurdo Station Broadcast Technician Eric Sturm, above, videotapes a group of about 40 people who recorded a holiday greeting for the ABC show “Good Morning America” on Dec. 15. Below, James Battaglia, center, displays his pink flamingo Flo and Kerry “Summer” Snow, bottom center, wears an “alternative Santa hat” made by her mother as they participate in the greeting. Photos by Mark Sabbatini/The Antarctic Sun



Profile

Housing hundreds around the world

By Melanie Conner/Sun staff

The last time Bevin Gumm coordinated other people's living arrangements was at a refugee camp in Thailand.

It was also her most challenging.

Gumm was in Thailand, working as an English teacher in 1992, when four border camps unexpectedly closed and 18,000 refugees arrived overnight at the camp, whose population was already at 13,000.

Gumm, now housing coordinator at McMurdo Station, spent nine months in 1992 in the Chonburi Province, Southeast of Bangkok teaching English to Laotian, Vietnamese and

Cambodian refugees in Thailand. The refugees were going to America and had six months to learn English and cultural and work orientation. The classes aided the success of refugees throughout their relocation to America, said Gumm.

"It was horrific. The displaced refugees were bussed in at night and they had to be roped off, so that they wouldn't be injured or tortured by guards," said Gumm. "The chaos of the situation haunts me to this day."

With the arrival of the refugees, the health of the camp deteriorated quickly.

"Everyone was sick, including myself," said Gumm. "I was losing hair and losing weight. I was down to 100 lbs."

"When I came home to the USA and got off the plane, my mom just cried because my health was so poor," said Gumm.

The living and working conditions were so poor that the only other American working there, a small handful of students from Harvard University, left the camp clandestinely during the night.

Living was tight. But the refugees and workers were versatile, and flexible, said Gumm.

She was paid \$30 USD a month and given a mat to sleep on and rice to eat, until eventually foreign aid for the camp was cut in 1994, forcing the camp to close and sending refugees back to the countries from which they came.

"It was very sad," said Bevin, "They thought they were on their way to America. Their ticket for a new life, which had already been envisioned for over a decade, crushed by reality of budget cut."

Gumm's Thai experience was not overly foreign to her. She went there after finishing her first stint of volunteer work in Nepal where she started out arranging housing for interns.

Modeling her work after her own study abroad experience in Kenya as an undergraduate student at St. Lawrence University in Canton, N.Y., she placed students with families throughout Nepal.

After taking a year off from graduate school and spending three summers in Nepal and a year in Thailand to continue her less-academic education through volunteer work, Gumm finished her graduate studies. She earned a master's in educational



Photo provided by Bevin Gumm

Bevine Gumm, center, and her parents visit with her Nepalese friends in Muktinath, Nepal, a village in the Annapurna Mountains.

counseling and a master's in educational psychology. Formal education behind her, she returned to Nepal to teach at the French International School. While there Gumm decided to put all her teaching and volunteer skills to the test by starting a Nepalese school for local village children, who had no other classroom education available to them.

"The trekking guides we got to know from previous years had so many stories about how happy they were to speak some English and they wanted their children to learn English too," Gumm said.

With the closest school a six-day walk away, Gumm and her team decided to build the school in Laprak, where her trekking guides were from.

From Katmandu, Laprak is a 12-hour bus ride over winding, bumpy and narrow roads to the town of Gorka and another three-to six-week walk on twisting and ascending mountain goat paths in the Himalayas.

"The village is very isolated from the holiday trekkers' paths," said Gumm. "We didn't see any foreigners."

The making of the school became a community-wide effort in the village of 6,000 people.

A voluntary tax-system provided everyone with a job or duty.

"The local community had to contribute somehow to the school through work, books or money, like taxes. Everyone helped with construction too," said Gumm. "We bought land and local materials and carried stuff from Gorka and teachers were all locally recruited.

After three years of negotiating and working with Nepalese government officials and businesses to obtain funds, permits, land, building equipment and materials, the Laprak Community School finally opened in 1994.

"It started as a private school, and it took five years of going through the permit process to finally make it a public school," said Gumm. "Teacher's salaries of \$40 a month come from the government's pay scale so I don't have to raise funds for their salaries, and the school now follows the Nepalese curriculum"

After finishing her school and leaving Nepal in 1998, she considered settling down into a career and a domestic life in the States.

But after four years of suppressing her wanderlust, Gumm took a job as housing coordinator for McMurdo Station in Antarctica, where she juggles dorm beds for scientists and staff as they pass through McMurdo on their way to field camps and listens to the complaints of unhappy roommates.

While handing out dorm keys in Antarctica lacks the altruism of volunteer work in Third World countries, she said what she likes most about Antarctica is the people.

"They have such incredible stories. This is not a normal cross-section of society. I guess that is why I like it."