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Waste Management Helps Town Recycle

by JO2 Trevor Poulsen

McMurdo's recycling program receives wide support throughout the community. People willingly sort through their trash and dispose of it in containers according to material type.

Residents participate in the program because they know their work will result in a cleaner environment. The town's Solid Waste Management department matches their efforts with an extensive sorting process.

Solid Waste processes more than five million pounds of trash each year for the United States Antarctic Program (USAP). Trash

comes from all field camps, including South Pole Station, and gets sorted in McMurdo.

Six Antarctic Support Associates technicians process trash while three equipment operators haul containers from sites around town to Building 185 (near the Vehicle Maintenance Facility).

"We do a daily reconnaissance to see what needs to be picked up, which dumpsters are full," explains Waste Technician Suzanne Tegen. "The equipment operators will go around and pick up the trash and recyclables and they're brought up to the barn (Bldg. 185) and further processed."

Technicians use an array of machinery to help them process trash including a compactor, wood grinder, bailer and conveyor belt.

Once processed and segregated according to type, Solid Waste employees place the material in orange milvans for shipment to the state of Washington. More than 300 milvans are shipped every year aboard the cargo ship Greenwave.

Solid Waste Management sends three categories of waste off the continent: 1) recyclables (paper, aluminum, metal, etc.); 2) burnables, from which energy is obtained; and 3) landfill (construction debris, etc.). Only sewage is returned to the local environment.

"The program seems to be very successful and it's due to the people in the community who are helping us out,"

Tegen said. "So it's very important that everybody segregate their waste accurately."

Tegen added that everyone should be sure to bag their burnables and rinse plastic containers bearing a triangle symbol with the number one or two. Solid Waste employees will visit work centers to provide further instructions on how to properly segregate trash.

A waste exchange program is also available for town residents on the LAN server under community information. This service provides a way for materials to be reused locally.

Antarctic Science Season Gears Up

by NSF PublicAffairs

Spring in Antarctica heralds new U.S. science efforts on several fronts: a series of cruises in the Southern Ocean to trace carbon cycling associated with plankton blooms; drilling to assess the stability of the massive ice sheets; and an expedition to search for more meteorites on the continent that yielded ALH84001, the now-famous meteorite from Mars that may contain fossil life.

The National Science Foundation (NSF) is supporting approximately 145 Antarctic investigations, based mainly out of three research stations during Antarctica's summer, from now through February.

The bulk of the research -- astronomy and astrophysics, earth science, glaciology, oceanography, atmospheric science, and biology -- is supported out of NSF's McMurdo Station, located on Ross Island, and at Amundsen-Scott South Pole Station, inland on the heights of the ice cap. Other projects are based at Palmer Station on the Antarctic Peninsula and on two research vessels.

Highlights for Antarctic research this season include:

Carbon and Climate in the Southern Ocean

Scientists led by Robert Anderson of Columbia University and Walker Smith of the University of Tennessee are mounting a major effort to understand the role of the Southern Ocean in the global cycle of carbon, and ultimately to predict the ocean's response to climate change. As the southern component of the decade-long Joint Global Ocean Flux Study (JGOFS), a study of carbon in the world's oceans, thirteen cruises aboard two ships -- the National Science Foundation's icebreaking research vessel, the Nathaniel B. Palmer, and the University National Oceanographic Laboratory System ship Thomas G. Thompson -- will take place from September, 1996 through March, 1998.

This field season's cruises will center mainly on the Ross Sea, starting with a cruise embarking in early October to study Antarctica's largest and most predictable spring bloom of phytoplankton in these waters, and its role in the carbon cycle. Two subsequent cruises will track carbon over the season, and investigate how trace metals, especially iron, affect plant production.

Deicing Dynamics of Sea Life

The growth and retreat of sea ice around Antarctica is one of the world's great seasonal events, yet little is known about how ice dynamics affect zooplankton and other animals in the ocean's topmost waters (the upper 100 meters). Three cruises in the Weddell Sea and associated studies, under a project led by Kenneth Smith of the Scripps Institution of Oceanography, will track the ecology of tiny animals -- zooplankton (floating) and micronekton (swimming) -- over one year, to capture how dramatic changes in sea-ice cover affect the animal populations. The project will develop an instrument to monitor populations at different depths, and will launch a remotely-operated vehicle to sample and observe animals beneath the sea ice.

The Rougher It Is, The Better They Like It

Biologists now agree that archaea, or archeobacteria, are one of the three major branches of life, in addition to bacteria and eukaryotes (the latter embracing plants, animals, and humans). Archaea seem to like environments that are very hot, or very salty, or strictly lacking in oxygen -- places where no other life can endure.

Recent studies, however, reveal a surprise: archaea comprise more than 30 percent of biomass in waters off Palmer Station, Antarctica -- the highest rates measured in the ocean. A team led by Edward DeLong of the University of California-Santa Barbara will sample archaea in the region this season, illuminating the ecology and biology of these mysterious organisms.

Hot and Ultraviolet

The greater amount of ultraviolet light (called UV-B) let in by the ozone hole reduces the productivity of marine phytoplankton, but how does UV-B affect Antarctica's terrestrial plants? How are such plants reacting to the 50-year warming trend around the Antarctic Peninsula? Thomas Day of the University of Arizona and his team will study the impact of UV-B and warming on the health of two vascular plant species near Palmer Station on the Antarctic Peninsula. The study may shed light on the possible consequences of global warming for land plants.

Drilling an Ice Dome in West Antarctica

Fast-flowing ice streams, analogous to rivers, drain part of West Antarctica's ice sheet out to the floating Ross Ice Shelf, and hence to the sea. How permanent is this ice sheet, which is actually anchored below sea level? As part of a major, multi-year initiative, the West Antarctic Ice Sheet program, scientists led by Kendrick Taylor of the Desert Research Institute will begin drilling a 1000-meter core from Siple Dome, a rise of ice located between two ice streams on the coast of the Ross Sea, and a critical location for taking the ice sheet's pulse.

The core's ice record is expected to span 80,000 years, including part of the last glaciation, and to have distinct annual ice layers back at least 6,000 years. The core will shed light on coastal climate and ice stream dynamics in the past. It will also be compared with the famous deep cores from the Greenland ice sheet, to assess whether the rapid climate changes recorded in Greenland had a global reach.

Flying Above the Rift

If West Antarctica's ice melted, sea level would rise worldwide by six meters. West Antarctica's swift ice streams lie above a geologic rift -- an area where the earth's crust is pulling apart, possibly with profound effects on the ice streams' behavior, and hence on the ice sheet's overall stability. An aerogeophysical survey headed by Donald Blankenship of the University of Texas at Austin and Robin Bell of Lamont-Doherty Earth Observatory is tracing how the sub-ice rift architecture affects the ice streams. The team uses an aircraft fitted with geophysical instruments to image the surface and bed of the ice sheet, while measuring the gravity and magnetic signature, a clue to volcanism of the rock beneath (this year's survey focuses on Ice Stream "D").

Vostok: The World's Deepest and Oldest Ice Core

Drilling to complete the world's deepest and oldest ice core will continue at Russia's Vostok Station in East Antarctica this season. Some 30 researchers from the United States, France, and Russia study the ice record, expected to stretch back perhaps half a million years.

Studies of Vostok's ice have already shown a close link between climate over the past 200,000 years and changing concentrations of greenhouse gasses in the atmosphere. The drillers plan to halt at approximately 3650 meters depth, stopping above Lake Vostok, the subglacial lake beneath Vostok Station that is comparable in size to Lake Ontario. The lake and any life it may harbor have apparently been sealed off from the atmosphere for hundreds of thousands of years. NSF provides flight support for the project and grants to glaciologists studying the ice core.

More Favorite Martians?

The news last summer that ALH84001, a meteorite from Mars found in Antarctica's Allan Hills, may contain fossils of early life startled scientists and the public. It also drew the spotlight to the Antarctic Search for Meteorites, akin

to a bargain-priced space mission on snowmobiles led by Ralph Harvey of Case Western Reserve University. Antarctica is actually unrivaled in its abundance of meteorites. Since 1976, the program has found more than 7800 specimens, including samples of the Moon and Mars, expanding knowledge of the primeval nebula that have birth to the solar system. This season, the team returns to the Allan Hills and will search other locations as well.

AMANDA Expands Its Neutrino Search

Antarctica's ice sheet serves as the detector for an unusual neutrino telescope, the Antarctic Muon and Neutrino Detector Array (AMANDA), a project based at the South Pole. AMANDA seeks to map the sources of the ghostly subatomic particles called neutrinos -- whether they come from active galactic nuclei, supernovae remnants, pulsars, neutron stars, or from elsewhere in or outside the galaxy. Such studies are at the forefront of the new field of neutrino astronomy.

The array already offers some provocative results. From a sample during the first nine months of observations, AMANDA has spotted about 12 particles that seem to be evidence of incoming neutrinos. This season, hot-water drillers will bore out holes to install seven new strings of detectors 2,000 meters deep, to join the four strings already embedded in the ice sheet.

Probing the Aurora

When the sixth Automatic Geophysical Observatory is put into place in a remote location on the Antarctic ice cap this season, it will complete a network of instruments that take continuous measurements of the aurora and the polar ionosphere (the highest layer of the earth's atmosphere). The AGOs will furnish data that could otherwise be collected only by an entire flotilla of spacecraft.

Retrieving the Flare Genesis Telescope

One of the world's largest solar telescopes circled Antarctica last year suspended from a giant balloon, and taking advantage of the 24-hour-long light, imaged sunspots and mapped associated magnetic fields that are believed to cause solar flares. The balloon was cut down above the Adelie Coast, 1400 kilometers from McMurdo Station, but foul weather permitted only the data recorder to be retrieved. This year, the French Antarctic program will assist the U.S. by mounting a traverse to recover the balloon payload, including the \$10-million telescope.

Sealheads Uncover Secrets Of Weddells

by Samantha Tisdal

The untrained observer may be hard-pressed to find anything endearing about Weddell seals. They are, after all, beasts which lay in a state of rotund torpor for hours or days on end, coated in their own excreta.

Even the "Sealheads" of S-009 -- scientists who spend large chunks of their lives observing the Weddells of McMurdo Sound -- are not beyond the occasional sarcastic remark concerning their object of study.

"We call them Ice Pigs," admitted Sealhead Tom Gelatt, a PhD candidate working on a DNA fingerprinting project to determine the paternity of seal pups. "They have an odor that's ... unique. The Weddell is one of the few animals that smells the same when it's alive and dead!"

"But you have to remember that when we observe them on the ice, they're in an unnatural state," added Senior Sealhead and Principal Investigator of S-009, Don Siniff. "In the water, they're extremely graceful."

They're also extremely vocal, talking to each other with complex electronic-sounding clicks and whistles, moans, grunts, and unearthly howls. Siniff and other researchers have recorded 42 different vocalizations among Weddells. There is even some work being done by one former Sealhead on different "dialects" that may occur

among isolated Weddell seal populations around Antarctica.

S-009 originated in 1968, and is among the oldest on-going research project at McMurdo. The project's primary purpose is to study the population of the perennial Weddell colonies of McMurdo Sound, with a study area stretching from Pram Point (at Scott Base) to Cape Evans.

Siniff, a professor at the University of Minnesota, has been with the project since its conception, although his former student Ward Testa took over the research for a period of eight years from 1986 to 1994. Many of Siniff's students have contributed to the project over the years. The current Sealhead team consists of Siniff, Gelatt, PhD candidate Rob Jensen, Masters candidate Mike Cameron, and self-described "contract" researcher Dan Monson.

Their work takes them wherever the Weddells of McMurdo Sound like to go. This mostly means perennial tidal cracks on the lee side of an island; places where seals can "haul out" of the frozen ocean. The Delbridge Islands - Inaccessible, Tent, Big Razorback, and Little Razorback -- as well as Turtle Rock, all host seal colonies. There are also colonies at Turk's Head Cliff, Erebus Glacier Tongue, Hutton Cliffs, and Pram Point.

The Sealheads' field camp at Big Razorback provides fairly convenient access to most of these colonies. When the weather permits, 12 to 14-hour work-days are common. Especially now, with pupping season well underway, and mating season just around the corner.

Every day in the field is a race to conduct censuses, locate and tag new pups, replace any lost or broken tags on the adults, or collect blood samples and attach radio transmitters to bull seals for Gelatt's paternity study.

After mating occurs (an underwater, rarely observed event), the chunky pups are weaned from their emaciated mothers, who have fasted throughout the six-week nursing period. Then the youngsters get a quick swimming lesson and disappear to mysterious parts of the Southern Ocean for four years. Those that survive will often return to their natal colony upon reaching sexually maturity.

All the years of data compiled by S-009 have revealed a relatively stable seal population in McMurdo Sound, with roughly 400 new pups born every year. Immigration of non-native seals may play a role in stabilizing the McMurdo Sound population. Additional hypotheses include the possibility that female reproductive cycles rise and fall in tandem with the eight-year oscillation in the Southern Ocean.

As much new data as the Sealheads manage to accumulate, the wondrous reality of working with Weddells never quite wears off.

"I still find it amazing that you can go up to a 1000-pound carnivore, take a bamboo stick with a scarf tied onto it, put it in front of her face, and attach tags to her pup's flippers," Jensen said. "It takes about 30 seconds. Then the mom looks back, sniffs the pup a bit, and everybody's happy. Try to do that to any other carnivore on the planet."

SCIENCE PROJECT UPDATE

- by JOC(AW) Jacqueline Kiel

Automatic Geophysical Observatory (AGO) Servicing and Installation. (S-296): This is an ongoing project that probes the aurora. This season, Ron Rainbow and his field-team will install the sixth and final AGO site, thus completing the network. The other five AGO sites will be serviced, calibrated and refueled. Additionally, the team will recover data.

These instruments take continuous measurements of the aurora and the polar ionosphere, which is the highest layer of the earth's atmosphere.

Freezing Avoidance in Antarctic Fishes (S-005M): Although McMurdo Sound fishes are exposed to great extremes of ice and temperature, antifreeze peptides enable them to avoid freezing. Dr. Arthur DeVries and his

team will look at the relationship among antifreeze levels in the fish, sea-ice cover and sea temperature; the structure and function of antifreeze molecules; and the structure and organization of the antifreeze gene.

Additionally, they will try to determine whether Antarctic fishes have mechanisms to dispose of accumulated ice in their bodies.

The team will collect both shallow water and deep-water fishes at various locations around southern McMurdo Sound.

Who Is a Firefighter In Your Neighborhood?

by Mark Lane and T.J. Gagnon

November 17, 1996 (that's next Sunday!) from 12pm to 5pm will be this year's Firehouse Expo '96. This is your chance to get to know your fire department and firefighters. We will be having an assortment of activities and displays to show you what exactly this fire department does to make McMurdo a safe place to live. In addition to these exciting displays, we will be giving away some great door prizes that were donated by MWR and the firehouse.

As firefighters, we are continually enhancing professional performance in areas of technical rescue, hazardous materials, fire fighting, emergency medical treatment, and aircraft rescue just to name a few. We will be giving tours and demonstrating most of these concepts, as well as, having some hands on displays for you to play with. We will have bowls full of our chief's famous "two-alarm chile" and there will be plenty of food and snacks to go around! We look forward to seeing you all at the Expo.

AROUND USAP

by JOC(AW) Jacqueline Kiel

McMurdo Station - The last two C-141 flights arrived at McMurdo Station last week. In an unusual move, a C-141 flight is scheduled for March 7, 1997 for a reverse Winfly operation. The aircraft will fly out from the "Pegasus" ice runway carrying the last of the Antarctic Support Associates personnel who will "winterize" McMurdo Station. This is the first time a C-141 will be used at the end of the season.

After receiving approximately five inches of snow over a two-day period, it took Fleet Operations personnel approximately 18 hours to clean up and groom the ice runway.

Byrd Surface Camp personnel arrived at the camp on Thur. Nov 7 to prepare for camp open-up, research, and eventual disestablishment of the camp at the end of January.

A New Zealand Air Force C-130 is scheduled to arrive on Mon., Nov 11. This is the first of the Royal New Zealand Air Force's regular flight season, which is expected to last about four weeks.

South Pole - Despite some delays due to bad weather, South Pole Winfly operations were completed on Friday, Nov. 1.

The Pole opened officially Nov. 6 when approximately 46 summer support personnel and researchers arrived at the station. These flights will allow for a turnover to the new crew and preparation for research. Winter-over personnel started departing the Pole on Nov 6.

R/V Nathaniel B. Palmer - The ship arrived at the ice edge Friday, Nov. 8 to transfer researchers to McMurdo Station and to on-load a new group of researchers. Helicopters will be used to transport the research parties between the ship and McMurdo Station.

R/V Polar Duke - The ship was to arrive at Punta Arenas, a small port in southern Chile. There ship will off-load researchers and prepare to on-load another group of researchers. The new research will focus on the seasonal ice cover and its impact on the community of the upper 100 meters of the water column in the Weddell Sea.

Additionally during the port call, the ship will undergo an annual ship inspection for Norwegian registry.

USAP PERSON OF THE WEEK

- by JO3 Evan Ortiz

Antarctic Support Associates Materials Person Thomas Kiefer is one example of how servicemembers can make the transition to civilian life.

Keifer helps issue materials to McMurdo from ASA Supply Operations. As a Materials Person he issues office supplies, hazardous materials, and cleaning supplies.

Kiefer compares his job similar to his former Navy job. "I was in the Navy for three years as a AMS (Aviation Structural Mechanic) fixing LC-130s for VXE-6," says Kiefer. "The work load is actually the same except for the uniform and duties," he added.

His last year in the Navy was spent in the runway supply. "The runway supply and being in McMurdo gave me the experience to work for ASA supply," said Kiefer.

This summer marks Kiefer's fourth year at McMurdo, three years with VXE-6 and one year with ASA. "This will be my final year in Antarctica," he said.

Kiefer lives in Gainesville, Florida and will attend Santa Fe, Community College next year.

NAVY NEWS

VEAP Service Members May Enroll In Montgomery G.I. Bill

by SMSGT Sgt. Jim Katzaman, Air Force News Service

WASHINGTON (NWSA) -- For the next 12 months, active-duty service members in the Veterans Educational Assistance Program may enroll in the Montgomery GI Bill.

The Veterans Benefits Improvements Act, signed into law by the president, makes the change possible. DOD, Department of Veterans Affairs and service officials must still decide how to enroll service members.

Switching from one education financial aid program is not mandatory. Those who switch from VEAP can apply \$1,200 of their refund direct to Montgomery to receive that GI Bill's full benefit.

Personnel officials will contact those now out of the service who were on active duty and enrolled in VEAP when the Veterans Benefits Improvements Act became law on Oct. 11. They are also entitled to enroll in the Montgomery GI Bill.

BUPERS announces Officer Selective Early Retirement Boards

by LT Pamela Kunze, BUPERS Public Affairs

WASHINGTON (NNS) -- The Bureau of Naval Personnel (BUPERS) has announced details of Officer Selective Early Retirement (SER) Boards required in FY 97.

Currently, the requirement exists to SER approximately 253 officers in the grades of CAPT, CDR, LDO LCDR and CWO4. There is no plan for any enlisted SER boards this year or in future years.

NAVADMIN 258/96 provides a preliminary forecast of the number of SERs required in FY 97 by competitive category and grade. However, prior to convening the officer SER boards this number will be updated based upon numbers of requests for voluntary retirements.

In addition to forecasted numbers of SERs, NAVADMIN 258/96 outlines eligibility criteria, notification procedures and PCS limitations. Amplifying information is available by contacting the BUPERS Officer Retirements Branch (Pers-272) at DSN 224-2690 or commercial (703) 614-2690/3366.
