

USAF supports scientists at one of the most inhospitable places on Earth.

The Deep Freeze

**Photography by TSgt. Michael T. Smith (ANG), with
SrA. Richard T. Kaminsky and MSgt. David Nolan**



Ski-equipped LC-130s of the New York Air National Guard help provide logistics support to the National Science Foundation's US Antarctic Program.



The US long-term supply mission to Antarctica began with Operation Deep Freeze in 1955–56, when an airfield was built at McMurdo Sound.

The US Navy went on to provide logistical support to American scientists in Antarctica for the next 44 years. The 109th Airlift Wing, Schenectady County Airport, N.Y., began augmenting the Navy in 1988.

An aircrew member of the 109th AW, during a routine stop at the South Pole.



USAF photos by TSgt. Michael T. Smith



The New York ANG has a great deal of experience in the unique demands of polar operations, going back to 1975, when it began flying the LC-130 to support Distant Early Warning Line radar installations in Greenland. The unit began providing logistics help for National Science Foundation scientists in Greenland three years later.

At left, a familiar yet unfamiliar sight: An LC-130 is met by a ground support crew that, in the Antarctic climate, uses sled- or ski-modified equipment.

By the early 1990s, downsizing of the Navy and a need to concentrate on core competencies led DOD to conclude that Deep Freeze missions could be best performed by the Guard. A three-year transition of LC-130 operations from the Navy to the 109th began in Fiscal 1997. As part of it, the Air National Guard established ANG Det. 13—which includes eight military members and six civilians responsible for operations, maintenance, and administration. The unit, located a world away from the home stations of its Guardsmen, operates year round from Christchurch, New Zealand, the staging center for Antarctic logistics support.

At right, the commander for Deep Freeze and Det. 13 personnel hold a morning operations meeting.





Seven nations lay claim to portions of Antarctica, but those seven and 37 other countries abide by the 1959 Antarctic Treaty—basically to use the area for peaceful purposes only.

Above, mountains and glaciers are part of the majestic scenery. At left is an ice cavern. An ice cap with an average thickness of 1 mile covers most of Antarctica's 5.5 million square miles. What's not covered with ice is barren rock. Yet scientists believe this land mass holds answers to Earth's past and future. Discovery of a mammal fossil in 1982, for example, proved that the continent was connected with South America as recently as 40 million years ago. Discovery of four new fish species have given biologists insight into the evolutionary process.



Wildlife in Antarctica includes this Weddell seal. The continent has no indigenous human inhabitants, but nearly 30 nations send researchers to Antarctica. NSF has three year-round stations there: McMurdo, Amundsen-Scott South Pole, and Palmer.

Air Force Reserve Command C-141 crews have participated in Antarctic supply missions since the 1960s. The ANG's 109th has overall command of the mission today, providing tactical airlift support from Christchurch to McMurdo and within the continent, as well as intercontinental airlift during the ski-only months of December and January. AFRC handles intercontinental resupply during the other months of the year. Here, a C-141B from the 62nd Airlift Wing, McChord AFB, Wash., is off-loaded while at McMurdo.



USAF photo by SrA. Richard T. Kaminsky

USAF photo by MSgt. David Nolan



A C-17 from the 62nd AW sits on a ramp at McMurdo on Oct. 15, 1999, the first time a C-17 had landed in Antarctica. It was there as part of the validation tests for future C-17 flights to the continent. This summer the 62nd handed its part of the operation over to AFRC's 4th Air Force, March ARB, Calif., which will manage the intercontinental missions for about four years, while the 62nd AW transitions to C-17s, trains the crews, and gets them certified for the ice missions.

C-5s have also played a major role in Deep Freeze, flying in such oversize cargo as helicopters and handling maximum cargo loads as time runs out on the Antarctica deployment season—October to February.

A C-141B from the 62nd AW sits at McMurdo, which has a sea-ice runway used by wheeled aircraft between October and December. This runway begins to melt in mid-December. Operations then focus on Williams Field—located 10 miles from McMurdo—the runway for ski-equipped airplanes. A permanent glacier-ice runway called Pegasus is located about 17 miles from McMurdo.



USAF photo by SrA. Richard T. Kaminsky



Above is a view of McMurdo Station, which is the largest Antarctic station and was built on volcanic rock in 1955–56. McMurdo consists of nearly 90 buildings and has a helicopter pad as well as landing strips, a pier, water distillation plant, and firehouse. In the summer, McMurdo’s population exceeds 1,000; only about 200 winter over.

Significant exploration of Antarctica began with British Capt. James Cook in 1772. Among its famous explorers was Roald Amundsen, a Norwegian, and Robert F. Scott, British. They separately reached the South Pole on Dec. 14, 1911, and Jan. 17, 1912, respectively. However, Scott and the 11 others in his party died in the severe weather that overtook them on their return trip. The hut at left was built by Scott on an earlier expedition (1901–04). It is today still stocked with the equipment and stores he left there almost a century ago, preserved by the cold, dry air.

It’s dark for half the year, and during the other half, the sun does not set, creating conditions like this “false sunset” at left.



Aircraft maintenance is dangerous in a place where it's done outside and the mean temperature is zero degrees Fahrenheit. The maintainers can't expose their uncovered fingers for more than a few seconds. They must also work fast because hydraulic and other fluids begin to freeze.



USAF photos by TSgt. Michael T. Smith



A 109th LC-130 lands on the ice runway at the Amundsen–Scott South Pole Station on a 1998 mission. Along with sluggish hydraulics, the challenges of landing an aircraft in Antarctica include the lack of contrast between the runway and its surroundings; everything is white. Weather minimums are high because of the unpredictable fog and high winds.

The station relies totally on the ANG's LC-130s. From February to October, the South Pole personnel live in isolation, conducting research in glaciology, physics, biomedicine, and meteorology.

Although the peak summer population at Amundsen–Scott is barely 200, the US has been present at the geographic South Pole continuously since November 1956. The geodesic dome is the central facility. Steel archways house fuel supply, power, medical, and other facilities. It was from this site that the 109th evacuated physician Jerri Nielsen in October 1999. She had discovered a lump in a breast and had been treating herself with medical supplies airdropped by an AFRC–active duty C-141 crew. It was 58 degrees below zero when she was flown out.





Above is the volcano Mt. Erebus, about 20 miles from McMurdo. Still active, the volcano steams continually and erupts, although not violently. At left, an LC-130 from the 109th. Below, ice fog forms on the expanse leading to McMurdo.

Antarctica was the last continent to be discovered and remains a remote, inhospitable environment. Most of what has been learned about the area was discovered in the last 100 years. With help from a USAF supply chain that extends 12,650 miles back to upstate New York, American scientists can continue their studies of the coldest, harshest continent on Earth. ■

