Amundsen-Scott South Pole Station

National Science Foundation

Celebrating a Century of Science & Exploration

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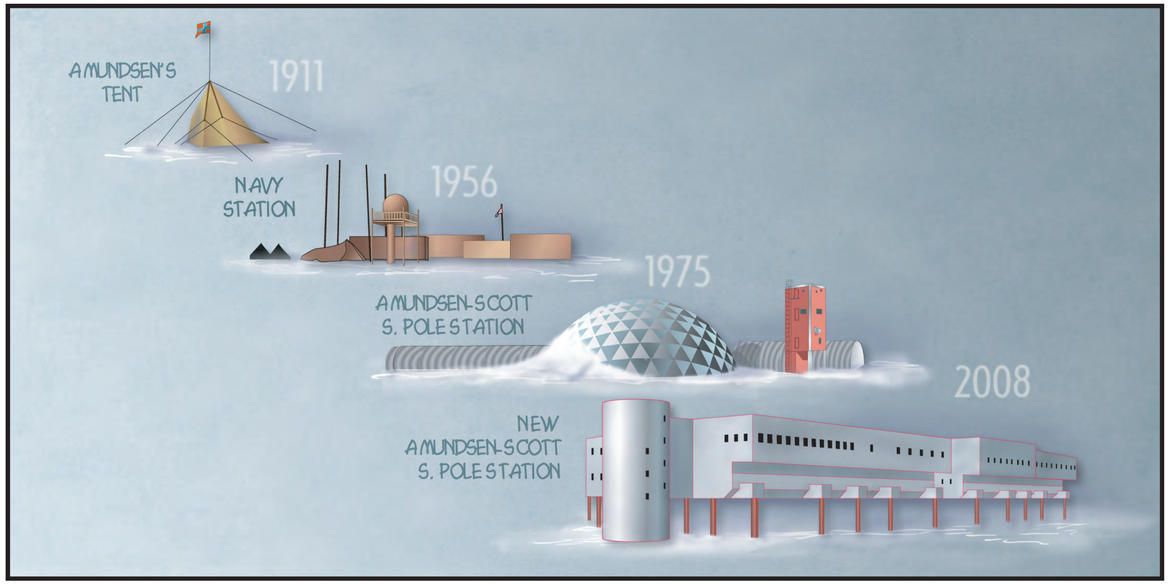
Amundsen-Scott South Pole Station is one of three year-round Antarctic research stations operated by the National Science Foundation, which manages the U.S. Antarctic Program. The United States has maintained a scientific station at the South Pole since the International Geophysical year in 1957. The current elevated station, the third station on the site, is the most imposing structure ever built at the Pole and the 12-year construction project required 925 flights by ski-equipped LC-130 aircraft flown by the N.Y. Air National Guard. At 26,000 pounds of cargo per flight, a total of 24 million pounds of cargo were transported to complete construction.

In November of 2007, Popular Science magazine named the elevated station as one of its "Best of What's New" innovations of the year.
The station was dedicated on 2008 slightly more than 50 years after men spent the first winter at the Pole in 1957, during the IGY. That first group was an 18-member team of U.S Navy personnel and civilian scientists.

The elevated station replaced a station that was built in the 1970's. That station was covered by a signature geodeisic dome. That station has been dismantled and removed from the continent. The replacement of the dome was given critical support by the external panel which, in 1997 report, argued that the existing facilities at the South Pole were both outmoded and potentially unsafe. The report noted that "Antarctica today is a continent generally characterized by peaceful, environmentally friendly, human activity. High among the reasons for this situation is the role played by the U.S. over many years in helping create a system of treaties and international agreements governing the nature of human conduct on the continent. The presence of the U.S. in Antarctica is a key element of the continued stability of the region."



ROALD AMUNDSEN'S TENT

- First human presence at the Pole
- Erected by Amundsen (Norwegian) in December 1911
- Materials hauled by dogs
- Scott (British) reached this site in January 1912
- Scott and his men hauled their gear without dogs

NAVY STATION

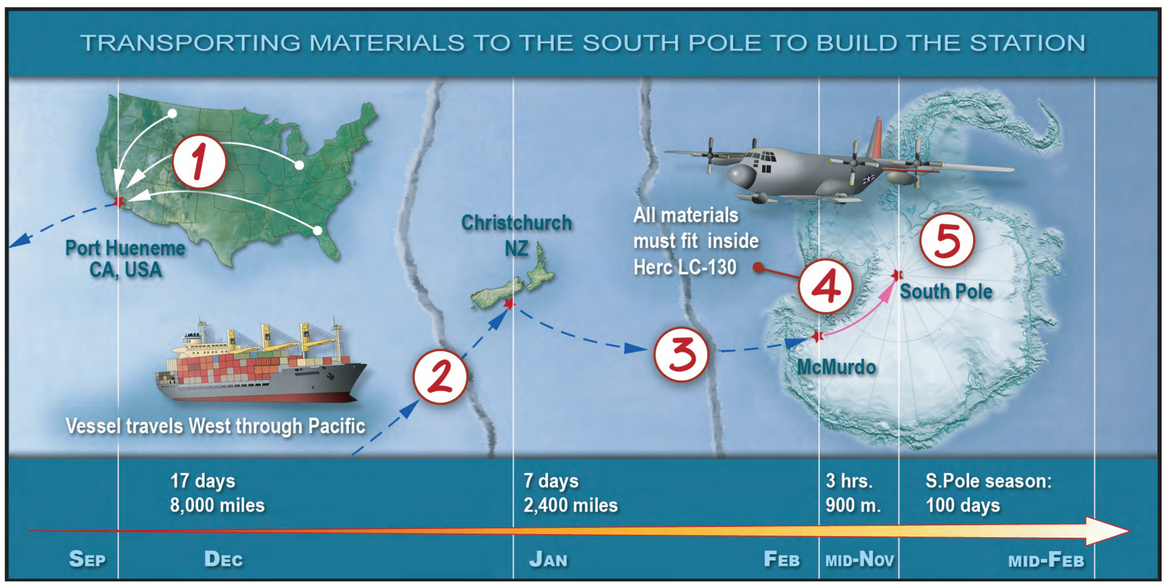
- Built by U.S. Navy in 1956 for International Geophysical Year
- First structure at the Pole for scientific purposes
- Capacity: 20 people
- Materials hauled in ski-equipped R4D, U.S. Navy version of a DC-3 aircraft
- Never intended to be a permanent structure

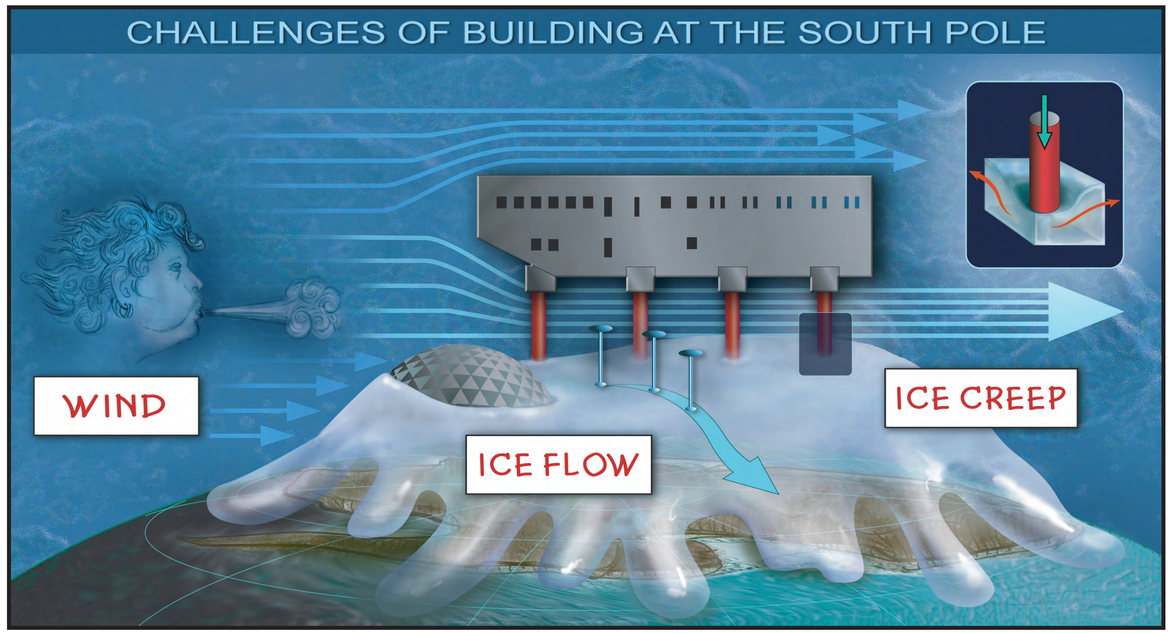
AMUNDSEN-SCOTT S. POLE STATION

- Built by NSF in 1975
- Iconic geodesic dome building
- In the mid-90's, e-mail communication began at the station
- Capacity - was 30 people 80 more in huts (summer only)
- Deconstructed and shipped back to the United States

NEW AMUNDSEN-SCOTT S. POLE STATION

- Elevated station
- Construction by NSF began in 1997
- Dedicated in 2008 in time for the International Polar Year
- Capacity: 150; 65K square feet
- Has windows, greenhouse, and is networked





WIND
- Constant winds result in snow pile-up on buildings.
- The new station faces into the wind, and is airfoil-shaped.
- The airfoil forces air into a compressed space where it accelerates.
- The fast wind scours out built-up snow.
- Years later, if snow still builds up, the building can be lifted two more stories on its columns.

ICE FLOW
- The station sits atop a 2-mile-deep layer of ice.
- Each year, the geographic South Pole is marked.
- Ice (cold water), slowly drips down to the ocean with gravity.
- The trail of yearly South Pole markers shows that the ice moves 33 feet per year.

ICE CREEP
- The weight of the building causes the ice to move locally.
- Ice compresses and shifts away from sources of pressure.
- Resulting variable rates of sinking make keeping the building level a challenge.
- Architectural elements built into the design will help meet that challenge.

Illustrations: Zina Deretsky, National Science Foundation