

The Antarctic Sun

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Dual breakers to take on double ice

By Kristan Hutchison

Sun staff

With twice the ice this year, the U.S. Coast Guard may need twice the ships to cut a channel to McMurdo Station.

This week the National Science Foundation officially asked the Coast Guard to send down a second icebreaker to help the *Polar Star* open a path through ice that is thicker and wider than ever recorded for this time of year.

"This unprecedented ice is certain to make the task of breaking the channel into McMurdo difficult, if not daunting," Polar Research Support section head Erick Chiang wrote to Coast Guard Commander April Brown this week, in the official request. "A second Polar class icebreaker (the *Polar Sea*) ... is deemed necessary and is hereby requested."

The backup icebreaker is likely to cost the NSF about \$3 million, said NSF Representative Dwight Fisher. The NSF already authorized Raytheon Polar Services Company to buy 1.3 million gallons (5 million liters) of fuel, enough to supply the second icebreaker and provide extra for the first icebreaker, Fisher said. Last year the single ice breaker used 1.1 million gallons (4.2 million liters) of fuel.

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Life below the ozone hole

By Melanie Conner

Sun staff

Sunglasses and sunscreen. They are not always the first items stowed away for a trip to Antarctica. But they should be.

"November is the most dangerous month for eyes and skin in Antarctica," said John Marwitz, professor emeritus from the University of Wyoming in Laramie, Wyo., who recently left Antarctica, where he and others were conducting ozone studies.

In November, the sun rests high above the horizon in the Southern Hemisphere, allowing ultraviolet (UV) rays to penetrate the recently-thinned stratospheric ozone layer. The UV rays can cause eye cataracts and skin cancer in people.

"When the sun is high in the sky, UV light is coming through fewer atmospheres. When it comes from the side, the light is scattered," said Chuntao Liu, of the University of Wyoming.

The stratospheric ozone is at its thinnest from now until December when the air warms, the polar vortex breaks up and the ozone begins its recovery, which completes the annual growth and destruction cycle of the ozone.

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Photo by Melanie Conner/The Antarctic Sun

Dave Anderson of Calif, right, and Dennis Rabehl of Minnesota walk to the dining hall during a condition two weather alert at McMurdo Station.

Chilling out in the wind

By Mark Sabbatini

Sun staff

Those working outside might not feel any warmer on windy days, but trust the government - it's no longer as cold out there as you think.

A revised wind chill temperature index effective in the U.S. and Canada as of this month generally lists the "real" temperatures for windy situations as warmer than previously calculated. A 15 mph (24 kph) wind on a minus 10F (-23C)

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Quote of the Week

"Presumably there's something very sexy and attractive about a male blowing bubbles."

- Researcher regarding seal mating behavior

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"We think they'll use more fuel probably than a normal year," Fisher said.

The fast ice now extends to more than 74 miles (118 km), with no sign of breaking up, Chiang wrote. The farthest the fast ice has been recorded before was 46 miles (74 km).

The unusual amount of ice is the result of a state-sized iceberg, B-15, which is protecting the ice from winds and currents that would normally break it up, said Christi Montgomery, liaison for the National Ice Center in Washington, D.C.

"We basically see that as a direct result of B-15 orientating itself north and south right up against C-16 which is rotated and pushed right up against Ross Island," Montgomery said. "(The ice is) looking pretty thick. It's going to be pretty difficult for Operation Deep Freeze. They're going to run into some ice they haven't really experienced yet."

The average ice edge over the past 20 years has been 25 miles (40 km) out, according to Chiang. Some years it's been as little as 6 miles (9 km), Montgomery said.

The Polar sister ships can each cut through ice up to 6 feet (1.8 meters) thick. Beyond that the breakers must back and ram to bash their way through ice up to 21 feet (6.4 meters) thick. The sea ice they'll face this year currently ranges from 9 feet 5 inches to 4 feet 5 inches (2.9 to 1.3 meters) thick. Montgomery doesn't expect the ice to thin much, "not enough to really make a big difference."

The extensive sea ice is enough of a concern that the McMurdo Field Safety Training Program set up 15 monitoring stations to measure ice depth, temperature and snow cover along the possible ice breaker path from the ice edge to McMurdo Station.

Normally the icebreaker is able to lead supply ships through the Ross Sea to McMurdo by the second week in January, but this year the National Ice Center predicted the shipping channel won't be ready until about Jan. 20.

By working together the dual icebreakers may be able to speed that up. The *Polar Star* left Seattle Nov. 1 on her way south to McMurdo, wrote Commander Brown in an e-mail. The *Polar Star* will be taking her time getting here. She will make three port calls to pick up fuel, equipment and scientists. Along the way the scientists will be installing instruments, testing the water, and taking biopsies from whales. The *Star* should meet the ice edge about Dec. 28, Brown wrote.

The *Polar Sea* is in the shipyard now, and won't be ready to sail until early



Photo by Mark Buckley/Special to The Antarctic Sun

Ted Dettmar measures the depth and temperature of the ice near the edge. The McMurdo Field Safety and Training Program set up 15 monitoring stations along the possible ice breaker path.

December, according to Brown. The *Polar Sea* will cruise straight to Antarctica and should catch up with the *Polar Star* at the ice edge by early January.

It's the second time the sister ships have been sent to Antarctica together. Both the *Star* and *Sea* were in the Antarctic in 1995, but for a different reason.

"I was on *Sea* at the time, and we got the late call to go South to assist *Star* due to major engineering problems from a newly installed engineering operating console," Brown wrote. "Although the ice was out to 43 miles that year, the second-greatest in over a decade, ice wasn't the primary reason in bringing the *Sea* down."

Bringing two icebreakers to Antarctica was common before the *Polar Sea* and *Star* were built in the late 1970s. They were the first Coast Guard icebreakers capable of cutting the way to McMurdo on their own, Brown wrote.

The reason for the extra ice this year is two large icebergs, C-16 and B-15, holding the sea ice in and blocking the winds and currents that usually push it out. When B-15 broke off the Ross Ice Shelf in March 2000 it was the largest floating object ever measured, a chunk of ice the size of Connecticut weighing about 2 billion tons (1.8 billion tons) and measured about 4,250 square miles (11,007 square km). It's now been chipped down to the size of Delaware.

"(B-15) is so large that it's really set up a current around itself," Fisher said.

In normal years the sea ice thins and breaks out of the Ross Sea in an hourglass pattern, as winds coming off the glacier

and ice shelf push the ice out, Montgomery said.

"You sort of have temperature and current eating away at the ice from both sides," Montgomery said. "But this berg is upsetting the whole flow."

The icebergs are also compressing the sea ice, holding it against the continent so it can't float away. Nor is there much hope of the icebergs moving any time soon, Fisher was told by a researcher studying B-15. Similar bergs have stayed in the Weddell Sea for 10 years.

"It will not move from where it's at until it breaks up," Fisher said he was told.

B-15 stretches lengthwise from Beaufort Island to Franklin Island. The islands keep the berg from floating in front of McMurdo Sound.

"As described, it was like two big defensive linebackers with their arms locked trying to go through a door," Fisher said. "When they let go they'll be able to get through."

Even if B-15 does move, it may not solve the problems. There's a chance it could drift in front of McMurdo Sound.

"As the (sea) ice comes out there's a potential that B-15 could float out of there," Montgomery said. "What direction and what way are up to it. It's the size of Delaware, so it can pretty much go where it wants."