

Scientists unsure why cold invading cod area

□ Temperature drop forces fish to seek warmer water

By Dennis Bueckert

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OTTAWA — Scientists are debating the reasons for a mysterious drop in the temperature of the North Atlantic Ocean which could seriously threaten the recovery of the cod fishery.

"There's absolutely no doubt about the cooling," said William Doubleday, a Fisheries Department scientist. "Since 1991 we've had very cold conditions off northeast Newfoundland, extremely cold."

In 1991 the temperature at the sea bottom off St. John's averaged -1.47°C over the entire year, as compared with average annual

"The water over the shelf in eastern Newfoundland is now occasionally below zero, which is desperate, and certainly below one degree. That's not water for Atlantic cod at all."

Dunbar admits he doesn't know what might be causing the stronger winds, saying that is a question for atmospheric scientists, not oceanographers.

Lawrence Mysak, director of the Centre for Climate and Global Change Research at McGill, said the cooling trend is part of a natural 10-year climate cycle involving the production of sea ice in the Arctic.

The ice "is exported to Greenland and the Iceland Sea, produces cold, fresh water there which migrates into the Labrador Sea, and this eventually disappears over a decade or so."

sea bottom on St. John's averaged -1.47°C over the entire year, as compared with average annual temperatures as high as 0.5°C in the '60s, Doubleday said.

"We are talking about how close you can get before the water freezes."

Because it contains salt, sea water freezes at a lower temperature than fresh water, at about 1.8°C . Cod prefer above-zero water and their productivity is reduced in colder water, Doubleday said.

Maxwell Dunbar, a McGill University oceanographer, said that stronger-than-usual westerly winds across the North Atlantic have displaced ocean currents, allowing more Arctic water to flow down along the Newfoundland shore.

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Yet another theory suggests the cooling is due to a large-scale oscillation within the ocean called the **thermohaline** oscillation, which operates on a 40- to 50-year cycle.

Siukuro Manabe, of the Fluid Dynamics Laboratory at Princeton University, said the two fluctuations could be occurring simultaneously.

"This is hotly debated," he said. "Some people say that, superimposed on the 40-year cycle, there's a 10-year cycle."

Henry Hengeveld of the federal Environment Department said the cooling could be part of global climate change associated with the greenhouse effect.