Rapid temperature increases above the Antarctic

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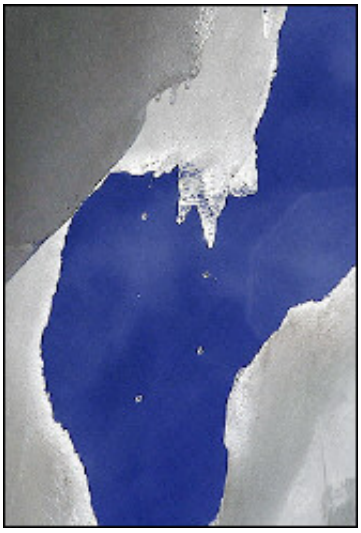

Antarctica's atmosphere is heating up three times faster than the earth average, British scientists said after a 30-year study released Thursday.

A new analysis of weather balloon observations from the last 30 years reveals that the Antarctic has the same 'global warming' signature as that seen across the whole Earth, but is three times larger than that observed globally. The results by scientists from British Antarctic Survey are reported this week in *Science*.

Although the rapid surface warming in the Antarctic Peninsula region

has been known for some time, this study has produced the first indications of broad-scale climate change across the whole Antarctic continent.

Lead author Dr John Turner of the British Antarctic Survey says, "The rapid surface warming of the Antarctic Peninsula and the enhanced global warming signal over the whole continent shows the complexity of climate change. Greenhouses gases could be having a bigger impact in Antarctica than across the rest of the world and we don't understand why. So far we haven't been able to determine the mechanisms behind the warming."

"The warming above the Antarctic could have implications for snowfall across the Antarctic and sea level rise. Current climate model simulations don't reproduce the observed warming, pointing to weaknesses in their ability to represent the Antarctic climate system. Our next step is to try to improve the models."

Daily launches of weather balloons have been carried out at many of the Antarctic research stations since the International Geophysical Year of 1957-8. The balloons carry instrument packages called radiosondes that measure temperature, humidity and winds up to heights of 20 km or more. Recently many of the old radiosonde records have been digitised and brought together in a project funded by the Scientific Committee on Antarctic Research.

Analysis of the radiosonde data showed a winter season warming throughout the troposphere, which extends up to about 8 km, and cooling in the stratosphere above. The largest warming of almost three quarters of a degree Centigrade per decade was found close to 5 km above the surface. This is over three times the rate of warming observed for the world as a whole.

The warming has occurred across the whole of the Antarctic and is apparent in the balloon data from Amundsen-Scott Station at the South Pole to the many stations along the coast of East Antarctica.

Although climate change at the surface of the Earth receives wide attention, the atmosphere in recent decades has in fact warmed most some 4-5 km above the surface, with the stratosphere cooling above. There is increasing evidence that levels of greenhouse gases have provided a blanket above the Earth trapping heat at lower levels and giving cooling in the layers above.

Air temperatures in the Antarctic Peninsula region have risen by over 2.5°C in the last 50 years, about 5 times faster than the global mean rate.

In recent decades both Polar Regions have shown very contrasting patterns of change at the surface, with the Arctic warming markedly, while there has been little change in the Antarctic outside of the Antarctic Peninsula region. Changes above the surface have not been investigated previously.

Source: British Antarctic Survey