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December 26, 2004

Grass flourishes in warmer Antarctic

JONATHAN LEAKE, SCIENCE EDITOR

GRASS has become established in Antarctica for the first time, showing the continent is warming to temperatures unseen for 10,000 years.

Scientists have reported that broad areas of grass are now forming turf where there were once ice-sheets and glaciers.

Tufts have previously grown on patches of Antarctica in summer, but the scientists have now observed bigger areas surviving winter and spreading in the summer months. Some fear the change portends a much wider melting of the ice-cap that formed at least 20m years ago.

Pete Convey, an ecologist conducting research with the British Antarctic Survey (BAS), said: "Grass has taken a grip. There are very rapid changes going on in the Antarctic's climate, allowing grass to colonise areas that would once have been far too cold."

Convey said many species of wildlife were at serious risk from such rapid change including penguins, seals, cold-water fish and giant sea spiders.

The findings come at a politically sensitive time with Europe and America clashing over the latter's refusal to sign up to the Kyoto treaty to limit greenhouse gas emissions. The confrontation may worsen with Tony Blair saying he is determined to push the issue up the international agenda when Britain assumes the presidencies of the European Union and the G8 countries next year.

The latest research was carried out on the Antarctic peninsula, which juts northwards towards Cape Horn, and the islands around it. More strongly influenced by changes in sea and air temperatures than the rest of Antarctica, these areas are an excellent place to measure effects of climate change.

Measurements over the past three decades show these are among the fastest-warming places on earth, with winter temperatures already 5C higher than in 1974. Many glaciers and ice-sheets are melting.

Convey said Antarctic hair grass and another species called pearlwort were the only complex plants capable of surviving on the Antarctic mainland. He said: "In the past they were at the limit of their range. They used to appear sporadically with one or a few plants growing in sheltered north-facing areas where birds or the wind dropped the seeds but they never did very well.

"What we are seeing now is dense swards or lawns forming and both plants growing much further south than ever before. It is quite

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remarkable.”

Research by Convey and his colleagues suggests one of the main reasons for the change is that the rising temperatures have brought forward the start of the Antarctic spring and delayed the onset of autumn, enabling the grass to produce mature seed which germinates and becomes established.

Antarctica has not always been ice-bound. It once had a temperate climate and was covered in dense vegetation. The Antarctic Peninsula was then joined to South America, creating a continuous land barrier along which warm water flowed southwards from the tropics. This water warmed Antarctica in the same way that the Gulf Stream now warms parts of Britain and northern Europe.

About 30m years ago, however, movements of the Earth’s crust carried South America northwards, cutting off the warm water. It was replaced by the circumpolar current in which extremely cold water flows in a constant circle around Antarctica, keeping it frozen and isolated.

John King, principal investigator for the BAS climate change programme, said: “We have also seen a sharp increase in the Roaring Forties, the powerful westerly winds that prevail around the Antarctic. One theory is that global warming is strengthening these winds.”

King and his colleagues believe such trends could continue, possibly even raising winter temperatures on the peninsula from their past average of -10C to near freezing. Eventually this could give the peninsula a climate comparable to that of Scandinavia.

A further climate alert is to be raised by Professor Lloyd Peck, Convey’s colleague at BAS. He will deliver a stark warning in the Royal Institution’s annual Christmas lectures on Channel 4 this week. Peck said this weekend: “Climate change in Antarctica is a warning of the globally catastrophic changes that will follow unless we act now.”

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