What is Climate Change?

Climate refers to the average weather experienced in a region over a long period, typically thirty years. This includes temperature, wind and rainfall patterns. Our climate is not static and has changed many times in the past in response to a variety of natural causes.

Recently, the Intergovernmental Panel on Climate Change (IPCC) in their Third Assessment Report concluded that, *"... most of the warming observed over the last fifty years is likely to have been due to increasing concentrations of greenhouse gases."* This essentially means the activity of man has been the overriding influence in the climate changes we have seen over this period.

Historical climate changes

Some will doubt the reality of "Climate Change", putting the changes down to natural weather cycles. However, over the past couple of decades we have experienced definite changes in weather patterns, with wetter, milder conditions being the most clear cut aspect of this change.

In order to highlight the changes over the past couple of decades, data have been collated from the Met Office to show the differences experienced between 1970-2000 (Figure 1 for rainfall) and 1999-2003 (Figure 2 for maximum and minimum temperature) against the 1961-1990 averages.

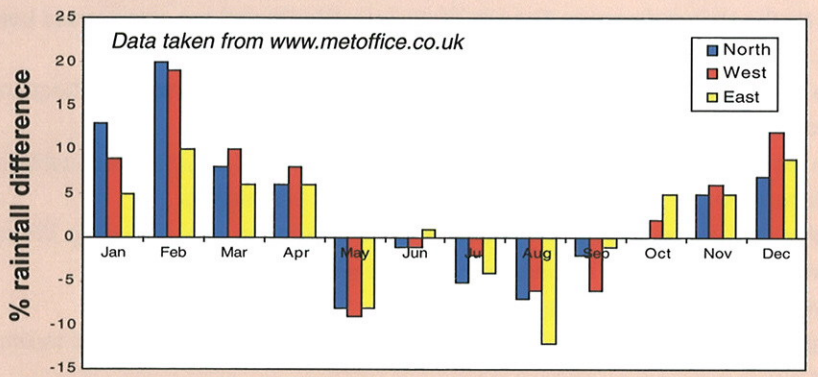

FIGURE 1. The regional percentage difference in mean monthly rainfall (mm) between 1961-1990 compared to 1971-2000 in Scotland.

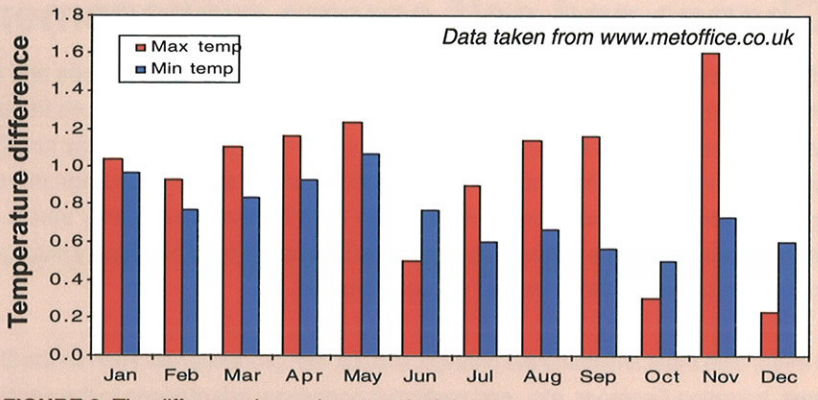

FIGURE 2. The difference in maximum and minimum temperature between 1961-1990 compared to 1999-2003 in Scotland.

Rainfall changes

- Scotland received 9% more autumn/winter rainfall (October-March inclusive) during 1970-2000, compared to the period 1961-1990.
- Summer rainfall (April-September inclusive) decreased by 3% across all regions of Scotland during 1970-2000, compared to the period 1961-1990.
- Over the past couple of years, we have received extremely wet winters, e.g. 1999/2000, when the period between October-March received 90% more rain in the West compared to the 1961-1990 average.
- In contrast, we have also received extremely dry summers, e.g. 2003, when 40% less rain fell during April-September in the East.

Temperature changes

- In Scotland, the average annual maximum temperature increased by 1.0°C during the period 1999-2003, compared to the period 1961-1990.
- Minimum temperatures have also increased by 0.73°C across Scotland.
- There have been extreme monthly increases with a 2.4°C increase in maximum temperature and a 2.1°C increase in minimum temperature in November 2003 in the North.

Future predictions

The future Climate Change predictions are set to continue these trends of warmer, wetter autumns and winters and hotter, drier summers. The main future predictions up until 2080 made in the document entitled 'Climate Change Scenarios for the United Kingdom: The UKCIP02 Scientific Report' are summarised below:–

- The UK climate will become warmer. High summer temperatures will become more frequent and very cold winters will become increasingly rare.
- This increase in temperature will increase the 'thermal growing season' for plants thus continuing the trend of recent years (since 1900 the growing season has increased by one month).
- Average annual rainfall across the UK will remain at current levels, or reduce slightly. Winters will become wetter. Summers will become drier. The intensity of winter precipitation will increase.
- Snowfall amounts will decrease throughout the UK.
- Higher temperatures and lower summer rainfall are predicted to reduce average soil moisture through the whole of the UK.
- Relative sea level will continue to rise around most of the UK's shoreline. Extreme sea levels will be experienced more frequently.

Climate Change and golf course management

Climate Change will of course pose certain challenges to the management of golf courses and at certain times will make it harder to produce firm, free-draining surfaces and healthy turf. However, if clubs implement sufficient long-term and sustainable management strategies to promote year-round play and healthy turf, Climate Change may also create new opportunities. For instance, drier and hotter summers may encourage more people to play golf and continuing milder winters may encourage more winter golf. Both scenarios may attract more members and visitors to Scottish golf courses. This will provide increased revenue to fund necessary changes in the course maintenance programme to minimise the impact of Climate Change.

Decision-makers in every club must anticipate the change, consult with professionals such as the Course Manager, Agronomist, Ecologist, Irrigation Engineer, etc., and make the necessary adaptations to the course management programme. It is vital to inform and educate your successors so the progressive strategies you implement are continued in the future, thereby sustaining course playing quality for future generations.

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