



Tweed Climate

History

It is clear that winters in the Tweed catchment are no longer as cold and snowy as they have been in the past. Records show that in 1620 it snowed continuously for 13 days and nights, resulting in the death of 90% of all the sheep in the South of Scotland. On Eskdalemuir out of 20,000 sheep only 40 were left alive on one farm and 5 on another. There were long term effects of this disastrous winter as well, farms were untenanted for years and others were turned over to common grazing. In the winter of 1772 the snow lay frozen on the ground from the middle of December until the middle of April. But the worst winter was in 1794 when a snowstorm on the 24th January in the Upper Ettrick killed great numbers of sheep as well as 17 shepherds.

Other evidence of the severity of winters in the 18th and early 19th centuries describe rivers in the catchment ceasing to flow because of ice dams. In 1837 the Lower Teviot stopped flowing, the river was completely dry and people could walk across it picking up trout that had become stranded in small pools. The ice dam that caused this had formed on top of the cauld at Ormiston. Eventually the pressure of the build-up of water broke through the dam. This type of event was not unusual and the Tweed mills often stopped in the winter because of the lack of water.

Monitoring Stations

There is now a network of climate recording stations spread over the Tweed catchment and nearby. This data is collected by the Meteorological Office. Most stations do not collect a full set of data, but those that do are classified as "synoptic".



Station Name	Synoptic	Catchment Sector
Eskdalemuir	+	Ettrick
Biggar	+	Upper Tweed
Glentress Forest	+	Upper Tweed
Galashiels		Middle Tweed
Bowhill		Ettrick
Blythe		Upper Tweed
Charterhall	+	Whiteadder
Floors Castle		Middle Tweed
Greycrook		Middle Tweed
Kelso		Middle Tweed
Sourhope		Teviot
Chillingham Barns		Till
Carterhouse	+	Teviot

Weather Stations in and around Tweed Catchment

The patterns that can be seen from the data gathered show that the upland areas of the catchment, to the North, West and South are colder and wetter than the lowland areas towards the East. There is even a narrow belt of virtually frost-free land along the coast, while the upland "horseshoe" around the catchment has over 80 days of frost a year.

Climate Change

The data collected has been analysed by SNIFFER (the Scotland and Northern Ireland Forum for Environmental Research). It shows that the average annual temperature is increasing rapidly in eastern Scotland while days of snow cover are decreasing. Average annual rainfall is not showing any difference in its trend, but the number of days of heavy rain is increasing. This means that eastern Scotland is now getting 10% more of its annual rainfall in the winter and 10% less in the summer. It is thought that this trend will continue with drier summers and wetter autumns and winters.

It may seem that there is not much that can be done about climate change but some useful measures can be taken. Planting bankside trees will shade and cool the water and fenced-off zones along streams allows vegetation to grow that can provide strong root-mats to hold banks together when the rivers flood.



Water Temperatures

From a fisheries point of view the most important aspect of climate change is water temperature. Fish and insects are cold-blooded creatures, so their activity depends on the temperature of the water that they live in. Milder winters mean longer growing seasons and warmer water means faster growing fish with Salmon and Sea-trout reaching smolt size earlier, however if the water becomes too warm it can damage fish.

Examples of the effects of climate change

Water management issue	Examples of the effects of climate change
Pollution	Changes in river flows could affect the impact of pollution in rivers and increase the amount of pollution to the sea.
	Higher intensity rainfall increasing run-off from agricultural and other land into the rivers.
	Increased plant/algae growth due to increased temperature.
Water flow regulation and abstraction (pumping water out of the rivers for agriculture)	Increased likelihood of summer droughts leading to reduced flow and changes in abstraction need.
Changes to the shape of the river.	More frequent and severe river flooding leads to higher rates of river erosion.
Biodiversity and alien species	Increased temperatures could give better conditions for alien species and not be so good for some native species.



Quiz

1. Historically in which three years were there particularly bad winters?
2. What happened as a result of the winter of 1794?
3. In what year did the Lower Teviot stop flowing and why?
4. Which businesses were affected by the Tweed freezing?
5. Which organisation received the data from the climate recording stations?
6. What is the word used to describe climate recording stations that collect full data?
7. Which area has almost no frost?
8. Which area has the most frost?
9. What is different between the annual rainfall in the summer and the winter as a result of climate change?
10. What can be done to help to keep the river water temperature down?
11. What can be done to decrease bank erosion when the river floods?
12. Using a dictionary, look up the word biodiversity and write down the meaning.



Quiz Answer Sheet

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