

# 3 Current flood risks and management

Past flooding is our primary source of information about existing flood risk. It allows us to identify where flooding occurs and how often it might happen in the future. It also provides us with information about how floods are generated and move through the catchment.

## 3.1 History of flooding

A record of historic and existing flood risk problem areas was originally compiled for the Esk and Coastal Streams CFMP Inception Report. This has been updated based on inception stage feedback and information gained during the scoping stage. Due to the relatively low level of development and isolation of parts of the catchment, there is not as much information on flood levels, extents and flows as for other more developed catchments, but there are several specific areas with a repeated history of flooding.

On the Esk, historical levels marked at Lealholm indicate that the three most significant historical floods in decreasing order of magnitude are the 1930, 1840 and 2000 floods. These levels may have been affected by the degree of blockage of the Lealholm Bridge, which is downstream of the chapel. However, newspaper archives also suggest the 1930 flood was significantly worse than the one in 2000. Of the northern coastal streams the towns of Skinningrove and Guisborough have historically been the worse effected by fluvial flooding. Several recent floods in Skinningrove including the most severe in 2000 saw approximately 178 homes inundated. In Guisborough there have been several reports of minor flooding events.

Table 3.1 and Table 3.2 summarise documented floods in the Esk and Coastal Stream catchment areas respectively. It should be noted that more recent floods will be better recorded, and consequently the table shows a relatively large number of floods in recent years. This should not be taken as an indication that the frequency of flooding has changed. The information also illustrates that the most severe floods tend to occur between July and October. This reflects the seasonal variation in rainfall intensity over the CFMP area, as discussed in the hydrology section of this report.

**Table 3.1 – River Esk Catchment Flood History**

Flood Event Date	Areas Documented As Affected And Extent	Relative Severity* (high/moderate/low)
2005	Whitby: Localised tidal flooding	low
2002	Sleights: Localised flooding	low
October 2001	Lealholm: flooding to several low lying properties Egton Bridge: low lying properties and road damage Ruswarp: Mill Court houses and roads flooded	moderate
October/ November 2000	Lealholm: extensive flooding in Lealholm Egton Bridge: limited flooding Sleights: flooding of Lowdale Farm, Ridge Lane, Railway Station and parks Ruswarp: cottages along Glen Esk Road, Mill Court Houses, Carr Hill Lane, The Carrs, the Bridge Inn Whitby: Bagdale Beck caused flooding	high
March 1999	Sleights: properties along Lowdale Lane, fields along right hand side of Iburndale Beck	moderate
September 1993	Lealholm: flooding to several low lying properties Ruswarp: Flooding at The Carrs	low

September 1976	Ruswarp: flooding of nursery gardens	low
November 1967	Lealholm: flooding to several low lying properties Egton Bridge: flooding of hotel and roads Sleights: Lowdale Lane and football ground Ruswarp: The Carrs, nursery gardens, Ruswarp Mill, Railway Cottage, Bridge Inn	moderate
1953	Sleights: bowling green along right hand side of Iburndale Beck	low
May 1951	Location unknown	unknown
September 1931	Grosmont: large rise in water levels, though no property flooding recorded, probably due to blockage of railway bridge downstream of Grosmont Sleights, Briggswath and Ruswarp: reference to extensive flooding, though no details given	unknown, but possibly high
July 1930	Lealholm: extensive flooding Egton Bridge: extensive flooding through village, road bridge collapses Grosmont: flooding to low-lying Waterloo cottages along the Murk Esk Sleights: property near railway station Briggswath: Briggswath Road inundated, stone bridge at Briggswath destroyed Ruswarp: extensive out of bank flooding, including The Carrs, Ruswarp Mill and adjacent roads, school, Bridge Inn and houses	high
July 1914	Lealholm: flooding of Lealholm Mill, of unknown magnitude	unknown
October 1903	Lealholm: significant flooding of Lealholm Mill	high
September 1866	Grosmont: Destruction of bridge	high
July 1840	Lealholm: extensive flooding at Lealholm, Sleights, Briggswath and Ruswarp: reference to extensive flooding, though no details given	high
July 1828	Ruswarp: destruction of iron bridge, flooding at The Carrs, overtopping of banks and flooding of cottages through Ruswarp	high

\* The 'relative severity' is a subjective scale based on the evidence available concerning the event. 'High' severity generally refers to a large number of properties flooding (for the area) possibly in a number of locations, causing significant damage, disruption and possibly risk to life. A 'moderate' event consists of flooding to several properties causing damage to those properties and causing localised inconvenience. A 'low' severity event would indicate only a few properties affected with some damage at those locations, but with no further disruption or risk to life.

**Table 3.2 – Northern coastal stream flood history**

Flood Event Date	Areas Documented As Affected And Extent	Relative Severity (high/moderate/low)
August 2002	Skinningrove: flooding evidence (video) Guisborough: flooding on New Road, Wilson Street, Hutton Lane and Rectory Lane	unknown
October/November 2000	Skinningrove: flooding to 178 properties Loftus: five properties at Dam Street and A174 flooded, evidence of flooding of the A174 Guisborough: flooding on New Road, Mill Street and Hawthorne Drive	high
July 2000	Skinningrove: flooding to 108 properties Loftus: five properties at Dam Street and A174 flooded	high
June 1998	Skinningrove: flooding to six properties	moderate
October 1903	Saltburn: bridge over Skelton Beck destroyed	unknown
October 1892	Guisborough: reports of some flooding	Unknown
November 1875	Guisborough: reports of severe flooding	high

Q3.1 - Are there any locations where you perceive that flood risk has grown significantly as a result of development, land use management, change in land use or climate change?

## 3.2 Sources and probability of flooding

### 3.2.1 Introduction

The history of flooding helps us to identify the areas which are potentially most at risk from flooding. In order to understand the flood generation process, we must look at each catchment in turn identifying issues and processes specific to that catchment. Numerical modelling can be used to replicate natural processes and help understand the extent and nature of fluvial flooding issues. To this end, four hydraulic models have been produced. The rivers modelled and the potential risk areas are listed in Table 3.3.

**Table 3.3 – Numerical model simulations**

Reference	River/Reach Modelled	Risk Area
3.2.2	River Esk from Lealholm to Whitby (including Murk Esk and Iburndale Beck tributaries)	Lealholm, Egton Bridge, Grosmont, Sleights, Briggswath, Ruswarp and Whitby
3.2.3	Chapel Beck through Guisborough	Guisborough
3.2.4	Staithes Beck (including Easington, Roxby and Dales tributaries)	Staithes
3.2.5	Kilton and Whitecliff Beck	Skinningrove and Loftus.

In addition to flooding from fluvial/tidal sources, recent studies have indicated that a significant proportion of flood-related insurance claims within the United Kingdom are from other sources. For example, the Autumn 2000 Flood Report produced by the Agency reported that some 42 per cent of flooding arose from sources other than rivers or the sea. These included surface water flooding, groundwater rising above ground level, and highway and sewer drainage systems. These other sources are discussed in sections after the river descriptions.

### 3.2.2 River Esk and tributaries



At Castleton a number of minor tributaries draining the moors and surrounding farmland converge to form the main river. The river at this point is wide and shallow during normal flows with a wide floodplain. The majority of properties are located away from the river with a few isolated buildings within the floodplain. The upper section of the Esk is characterised by meandering channel formations cut into pastoral farmland. The majority of settlements (such as Danby) are located away from the areas of severe flood risk.

There are a number of structures crossing this section of the river, although since there are few wooded areas in the immediate vicinity debris blockage is thought to be unlikely. A number of tributaries such as Little and Great Fryup Beck drain moorland to the south of the river.



At Lealholm the river flattens out making the banks an area naturally at risk from flooding and just upstream of Lealholm lies Crunkly Gill, a short 1km section of deep, narrow wooded gorge. The village has a bridge downstream which is prone to blockage during large floods due to its proximity to woodland. The local chapel pays homage to the flood events which have inundated it in 1840, 1930 and most recently in November 2000.

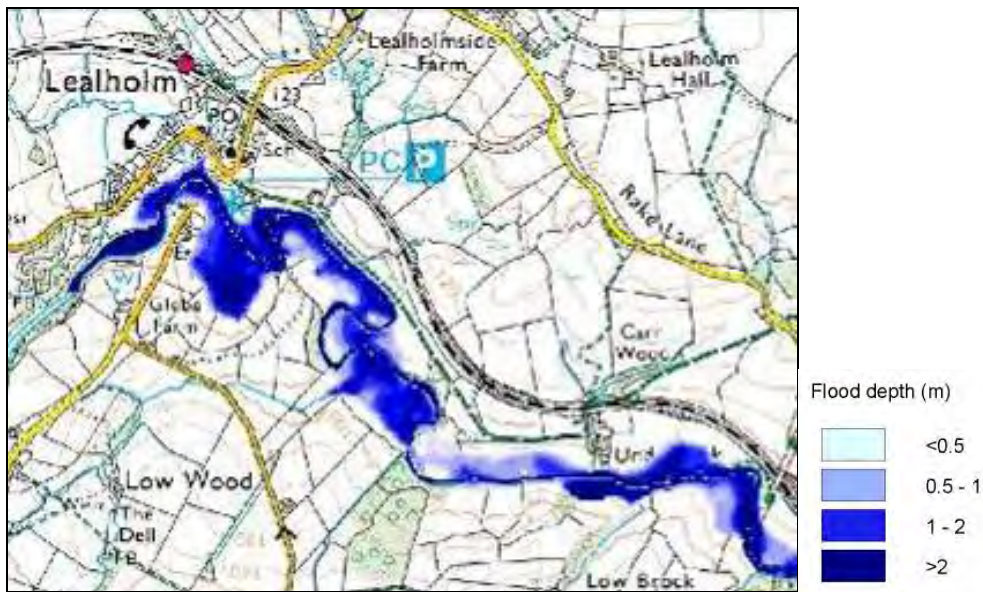


Figure 3.1 – Flood depth at Lealholm (1 per cent annual occurrence, assuming no defences)

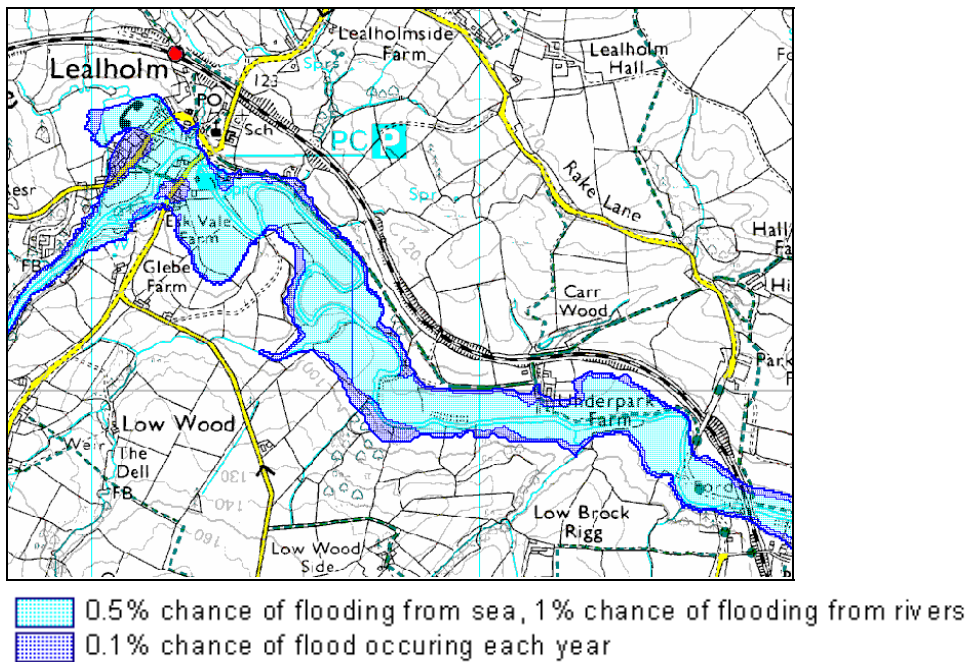


Figure 3.2 – Flood extent at Lealholm



Meandering through farmland the Esk passes two large railway bridges before entering a small wooded area adjacent to the raised settlement of Glaisdale. A number of structures as well as Limber Hill and East Arnecliff Woods separate Glaisdale and Egton Bridge, where a number of low lying properties lie adjacent to the watercourse. Egton Bridge has a history of flooding having occurred on several occasions.



Figure 3.3 – Flood depth at Glaisdale (1 per cent annual occurrence assuming no defences)

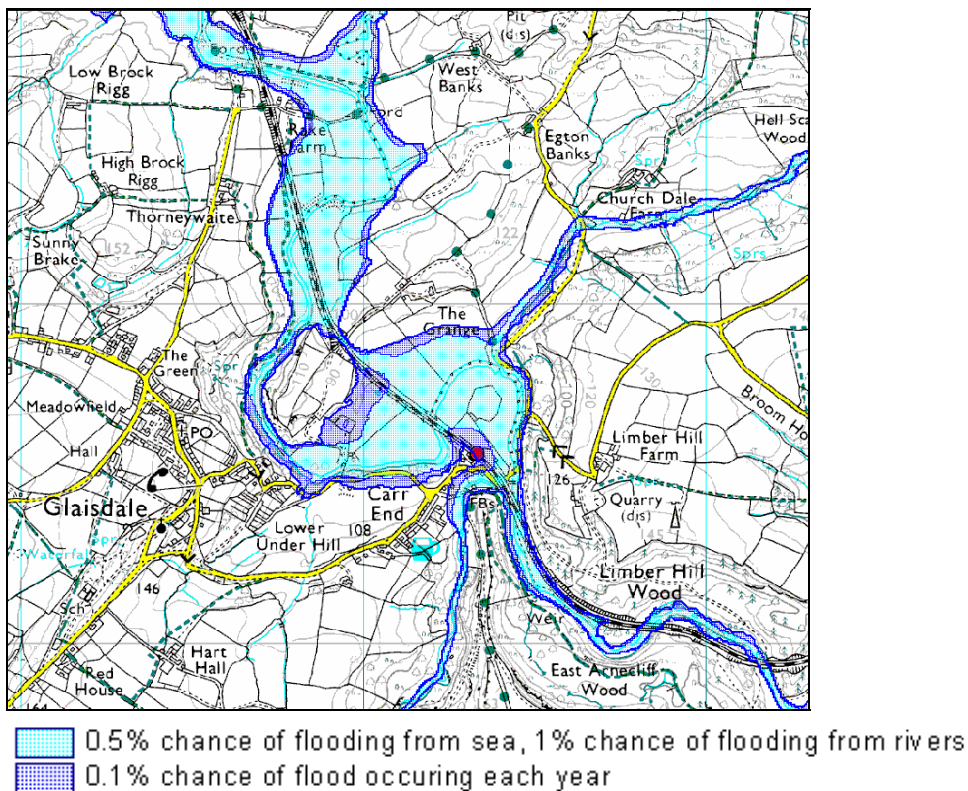


Figure 3.4 – Flood extent at Glaisdale



Figure 3.5 – Flood depth at Egton Bridge (1 per cent annual occurrence assuming no defences)

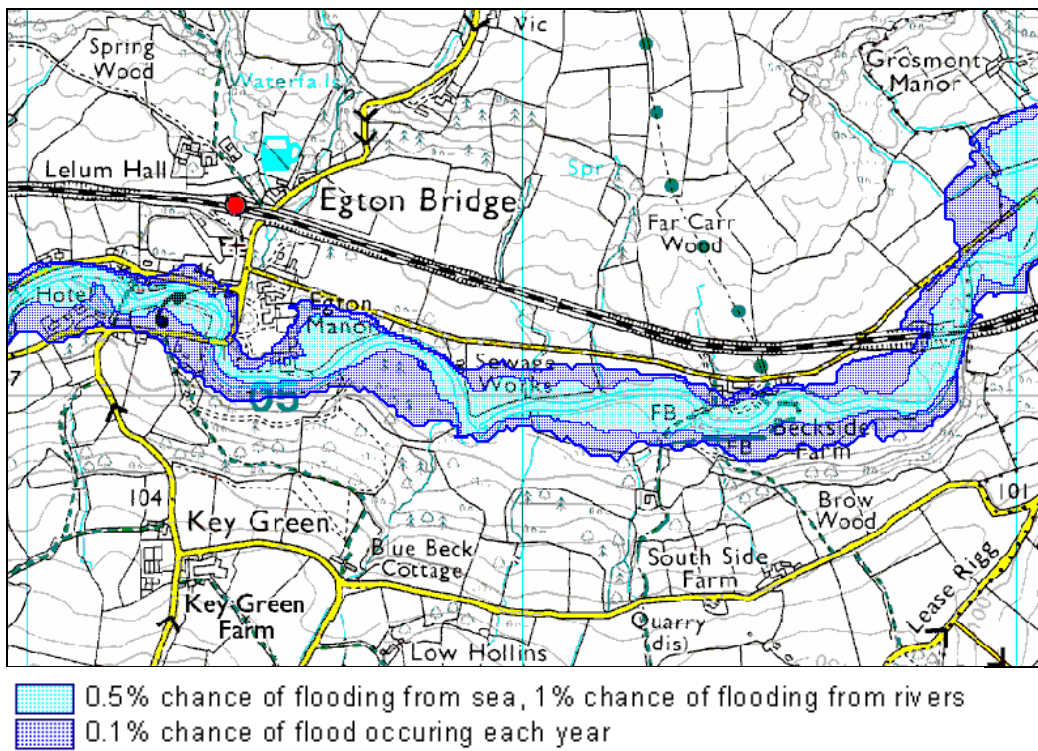


Figure 3.6 – Flood extent at Egton Bridge