Floods and Flood Prevention

Floods may be *expected* and welcomed, for they provide irrigation and fertile alluvial soil *(for example, the River Nile)*, or ***unexpected*** and harmful.

Three quarters of the world's fresh water is held as ice, so as Global Warming increases, flooding is likely to become a more common occurrence. It has been estimated that it could happen as frequently as every ten years. In Britain the south-east coast is particularly at risk.

The Impacts of Flooding

Try to fill in the missing letters:

Negative Aspects

- B_____ can be damaged as the interiors are covered with mud, or the f_____ could be undermined.
- On farms c_____ may be ruined and a_____ could be washed away or need rescuing.
- Economic - Home owners, insurance companies or governments have to p_____ to put right the damage.
- Transport systems may be disrupted as r_____ and r_____ tracks may be impassable or damaged.
- Water supplies can be damaged or con_____ with sewage. This could lead to dis_____ such as cholera.
- People may have to be put into temporary acc_____ or even re-housed.

Positive Aspects

- Floods deposit fertile soil, such as the annual floods on the River Nile.
- Floods wash away any pollutants.
- Floods replenish ground water.

Flood Prevention

(a) River channels can be widened and deepened.

(b) Embankments may be built along river banks to contain the rising water.

(c) Barrages or temporary dams could be constructed, such as the Thames Barrier.

(d) Flood relief channels can drain low-lying land.

(e) Dykes are often built to protect reclaimed land, e.g. The Netherlands.

(f) Holding reservoirs can be created to store surplus water.

The Thames Barrier was constructed between 1974 and 1982 to protect London from flooding. This will become more frequent as sea levels rise, and the area is slowly sinking so is more likely to suffer during high tides. Once raised, the four main gates are as high as a five-storey building. To date they have been needed on 88 occasions.

Examples of Floods

- In 1887 the Hwang-Ho (Yellow River) in China burst its banks, killing 900,000 people.
- On 16 and 17 May 1943, during the Second World War, the 'Dambusters' attacked the Möhne and Eder Dams in an attempt to disrupt German factories.
- In 1952 in Lynmouth, Devon, 34 people died in floods. Heavy rain fell over Exmoor and was channelled down the narrow valleys of the East and West Lyn rivers which met at Lynmouth.

- In 1959 the Malpasset Dam in Frejus, France, burst. The resulting flood killed over 500 people. It failed because it was built on a rock called schist, which cracks easily.
- On 16 August 2004 Boscastle in Cornwall was devastated by a flash flood. (See Case Study page 48)
- On 26 December 2004 a tsunami struck coastal regions in the Indian Ocean following an earthquake beneath the sea off the coast of Sumatra. About 150,000 people were killed in eleven countries as the waves swept across low-lying coastal areas and thousands of isolated islands, while over a million were left homeless, and without access to fresh water, food, or medical supplies. (See Case Study, Chapter 8, page 78)

Fill in the table below using the details on this page, or by adding other information you might find:

Examples of Floods			
Date	**Place**	**Number Killed**	**Cause**
1887			
1943			
1953	*East coast of England*	*Over 300*	
1959			
Aug. 2004	*Boscastle, Cornwall*	*0*	
Dec. 2004			*Tsunami*

Case Study: Flash Flood, Boscastle, Cornwall

Localised weather conditions were the cause of flash floods which swept through the village of Boscastle on the north coast of Cornwall on 16 August 2004. It is believed that 20 days' worth of rain fell upon high ground in just two hours. Water surged down the rivers that ran through the centre of the village and into the harbour. In a short space of time flood water rose to three metres in depth and swept away cars, uprooted trees and tore up roads, bridges and embankments. Witnesses reported seeing a caravan and two cars being washed over the top of a bridge. "To see a mobile home go by like a cork bobbing on the water was just unbelievable," another one said. Almost a hundred vehicles were swept from the roads and car park, through the main street, and out into the harbour or open sea, while six buildings collapsed as water raced through them.

The water rose so quickly that some people, many of whom were on holiday, were forced to climb to attics, rooftops or up trees to escape. Seven RAF helicopters, as well as two private ones, were involved in the rescue operation which winched around 120 people from the tops of buildings, upstairs windows and trees. One baby was winched to safety in a rucksack.

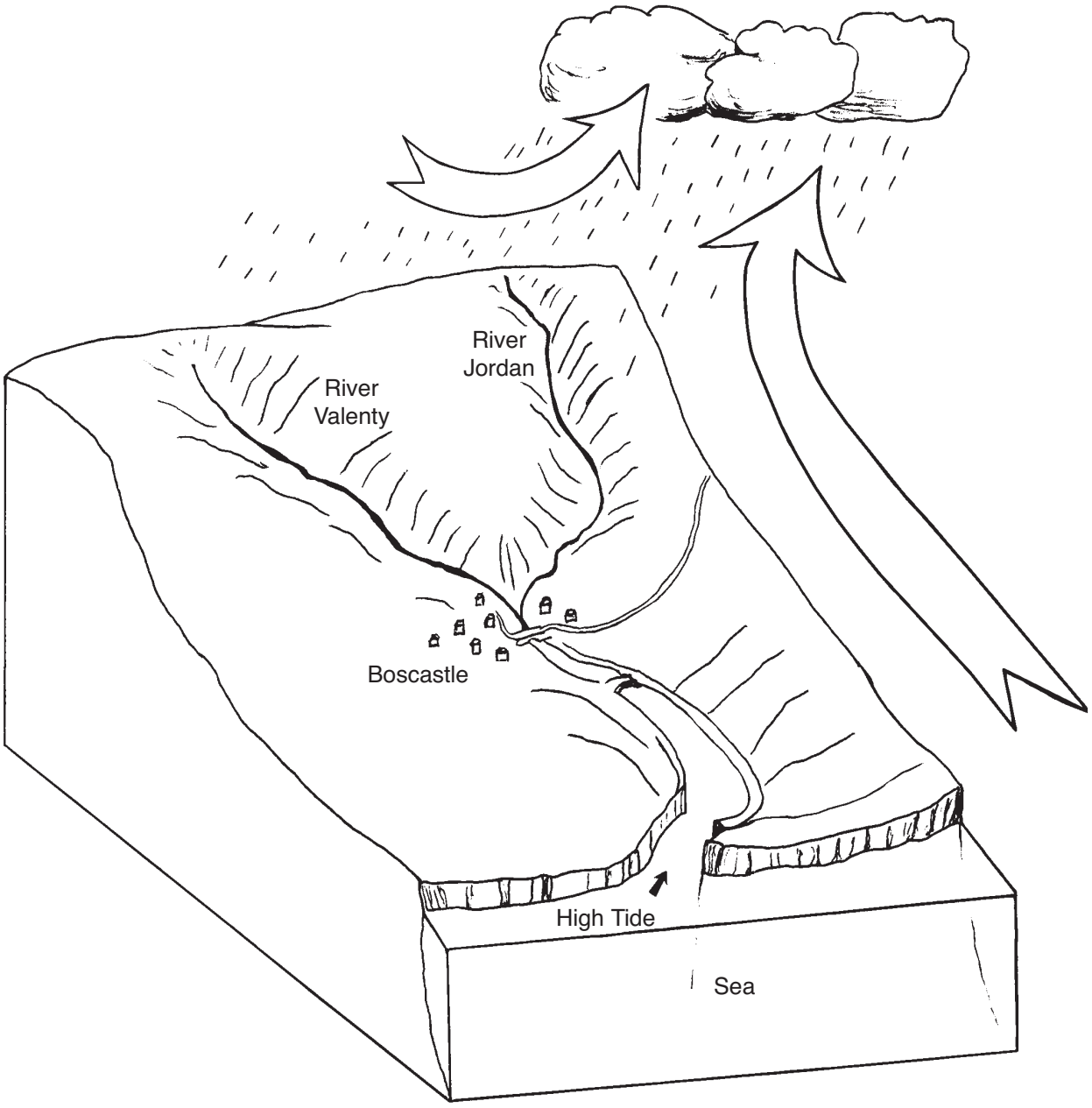
As the flood water receded, it became clear the village was devastated. A sea of mud covered everything, inside and out. Cars lay crumpled, half buried, some upside down. Large trees lay like broken match sticks. Personal possessions - fridges, crockery, tables, toys - stuck out from the mud.

Being the middle of the holiday season, the normal population of 800 people in this popular and picturesque seaside village had been swollen by visitors. Around 50 tourists were given temporary accommodation in a rescue base set up in a nearby leisure centre. Here they were provided with food, blankets, sleeping bags and clean clothes. As many had lost their cars, arrangements had to be made for them to get home. Some 33 pets, including dogs, cats, one cockatiel, five canaries, two hamsters and a pet rat, were rescued and had to be re-united with their anxious owners.

Miraculously, no-one appears to have died in the flash flood. Some time later a pile of shoes from a shop in Boscastle was washed up on the beach at Westward Ho! about 65 km. away!

The Causes

An air mass sweeping in from the Atlantic Ocean converged with an air mass inland. When they met over the high land of Bodmin Moor the air was forced to rise, condensing rapidly and causing heavy rain. This flowed down the narrow valleys which converged at Boscastle and neighbouring valleys. The problem was compounded by the high tide, so that the water could not escape so easily to the sea.



1) Use the information from the Case Study to write a newspaper report on the flood. You may like to write it from the point of view of a visitor, a helicopter winch man, or one of the fire brigade involved in the rescue operation.

2) Divide the information into *causes* and *effects*.

Flood Simulation

3) Use Figure 7, Chapter 1, for the following:

(a) Using a suitable colour, mark on any land that would be flooded if the water level rose to 50 metres above sea level.

(b) What effect would this have on man's activities in this area?

(c) Mark on to Figure 7 any methods you would use to prevent flooding in the future. (Use the Flood Prevention section above to help you if necessary.)