

## THE BOSCASTLE FLOODS OF 16 AUGUST, 2004

### Introduction

The worst floods in the UK tend to occur in August, which surprises many people. Ground becomes saturated in particularly wet summers, and if a severe storm then follows, the result is large volumes of overland flow (surface runoff). The classic example is the Lynmouth/Lynton flood of 16 August, 1952. This is on record as being the worst-ever river flood in the UK, with 34 deaths. Since that time, although property has been destroyed, no similar death toll has occurred. The Boscastle 2004 event has many similarities with the Lynmouth flood, not least that it curiously occurred on the same date, 16 August. The Daily Mail of 17 August 2004 called the Boscastle flood an 'eerie echo of [the] Lynmouth horror'.

### Boscastle in the news

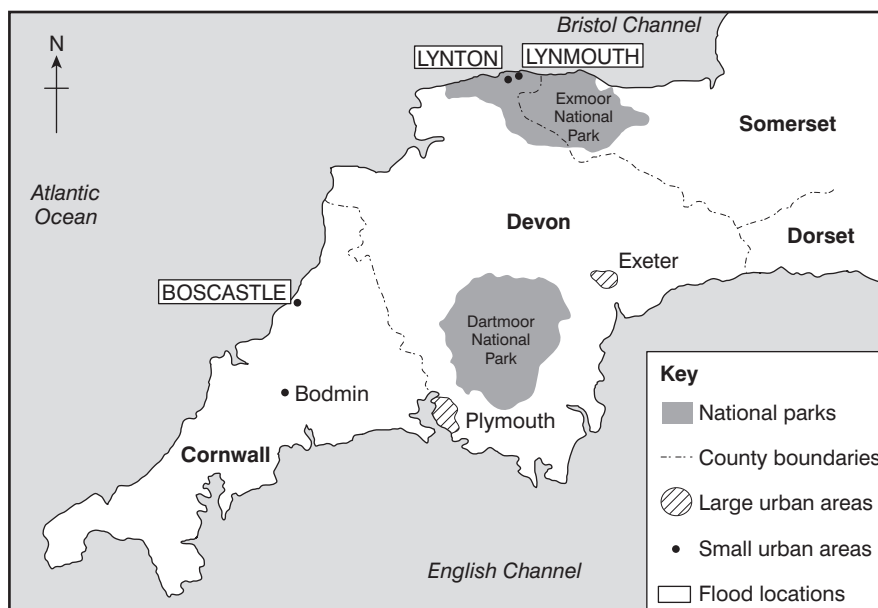
'In just over five hours, Boscastle went from a pretty Cornish tourist attraction to a disaster zone.'

Daily Telegraph, Wednesday, 18 August, 2004

The whole UK population knew of the Boscastle flood event almost as soon as it had happened. It was widely reported on television and radio, in newspapers and on the internet. It is interesting for the geographer to study news coverage of natural hazards. The media do not approach these topics quite as geographers do. In their attempts to explain the reasons behind the flood to the lay person, they select a limited number of the factors involved, so the whole picture may be by no means clear. Any mention of rock type, the previously wetter than average summer, and the combination of these to create overland flow, was almost impossible to find in the Boscastle coverage. Human interest stories, rather than geographical detail, sell papers, so emphasis is placed on damage to homes plus dramatic rescues and evacuations, of which there were several in August 2004.

There is also a certain amount of exaggeration in the press, e.g. 'the village of Boscastle will never be the same again'. Yet, if we look at Lynmouth, it was all rebuilt. Differences in Lynmouth 'before' and 'after' included some land not being

Figure 1: The South West, showing key locations in this unit



reused, as it was vulnerable flood plain, so best avoided. The river was diverted and various flood defences put in place, but, basically, the village was fully restored and looked much as it had prior to the flood. It is true that some individuals and families may never have fully recovered from the Lynmouth event, as 34 people did lose their lives and, back in the 1950s, it is likely that fewer homes and businesses would have been insured than is the case today. Boscastle, too, will be restored, with some essential adjustments, largely within a few months of the flood event itself.

### The settlement of Boscastle

Boscastle is a small village on the north Cornish coast (Figure 1). Lying at the mouth of the River Valency, it is surrounded by fairly steep, often wooded slopes. Just upstream from the village two steep-sided valleys meet, those of the Valency and the Jordan. A third stream, the Paradise, also flows through the village. On 16 August 2004 all three burst their banks, almost simultaneously.

Even if you have never visited Boscastle, you may have seen the village on television if you watched the 'Doc Martin' series broadcast in the summer of 2004. Some of the filming was completed there prior to the flood event.

Boscastle has a mixture of residential and local service functions, alongside an important tourist industry, earning income for the local community.

Prior to 16 August, the village had not been flooded in living memory. Events such as the Lynmouth flood took place much further up the coast, and so may not have been seen as significant. Few flood prevention measures had been taken.

### The physical factors

Severe flooding is the result of a certain set of circumstances. The table overleaf compares the circumstances of these two events, Lynmouth 1952 and Boscastle 2004. The physical similarities are striking.

Key physical factors promoting flash flooding are:

- impermeable rock
- small basin
- round basin
- steep relief
- lack of vegetation
- ground already saturated from previous rainfall
- storm downpours.

Impermeable rock does not let water drain through it. However, more permeable sandstones (Keuper Marl and Bunter Sandstone) underlie Exmoor, the northern half of which is drained by the Rivers East and West

Table: Comparison of factors in 1952 and 2004 floodings

Factor	Lynmouth/Lynton (1952)	Boscastle (2004)
Rock type	Sandstone (permeable)	Sandstone (permeable)
Basin size	Small c 100 km <sup>2</sup>	V. small c 30 km <sup>2</sup>
Basin shape	Each of the E & W Lyn basins are quite rounded	Rounded in upper basin, more elongated in lower
Relief	Peak of watershed 491 m; falls to coast over 6 km	Peak of watershed c 140 m: falls to sea over 4 km
Ground already saturated	Yes	Yes
Amount of rainfall in storm	>200 mm in 24 hours on top of Exmoor	50 mm in 2 hours in the early afternoon

Lyn. These join just upstream of Lynmouth. However, saturation of the bedrock from previous high rainfall resulted in the sandstone behaving as if it was, in fact, impermeable. The Boscastle area is geologically dominated by Millstone Grit, another variety of sandstone, and the situation was very similar. This effective impermeability encourages overland flow (surface runoff) and shortens the lag time on the hydrograph.

In a small drainage basin rainwater is likely to reach a channel in a relatively short time, simply because the distances involved are small. Similarly, if the basin is quite round in shape, flow distances to channels are minimised. Both circumstances contribute to a shortening of the lag time. The River Valency basin around Boscastle is very small. Neighbouring streams are fairly close by, though overall drainage density is not as high as with the many streams flowing northwards off Exmoor in the Lyn system.

The relief behind Lynmouth is both higher and steeper than that surrounding Boscastle, where no such mass as Exmoor exists. Nevertheless, individual slopes, especially the valley sides close to Boscastle village, have a considerable gradient. The slopes around Boscastle are also quite well wooded. Larger, denser vegetation does reduce flood risk, but in the upper valley, more dominated by grassland, circumstances are more akin to the grassy slopes of Exmoor.

The storm which resulted in the flash flood took place in the early afternoon. 50 mm of rainfall fell in the space of two hours and within another one to two hours the flood waters were in full spate. This represents an incredibly short lag time. Local people found this turn of events difficult to believe, as it was quite unprecedented.

### Human factors

The surge of water through the village was reported as being 10 feet (over 3 m) high. At one stage it was made worse by the street pattern and certain man-made structures. The village car park lies at the top end of the main street. Cars parked here were among the first objects to get washed down. One became trapped under the bridge carrying the road across the river. In its turn, it then caught even more material, branches especially. Water piled up behind this barrier, and when it gave way, the surge was huge. Many of the cars which began the day in the car park ended up wrecked in the harbour (50 in all). Others were just dumped by the floodwaters at all

Figure 3: Building damage at Boscastle

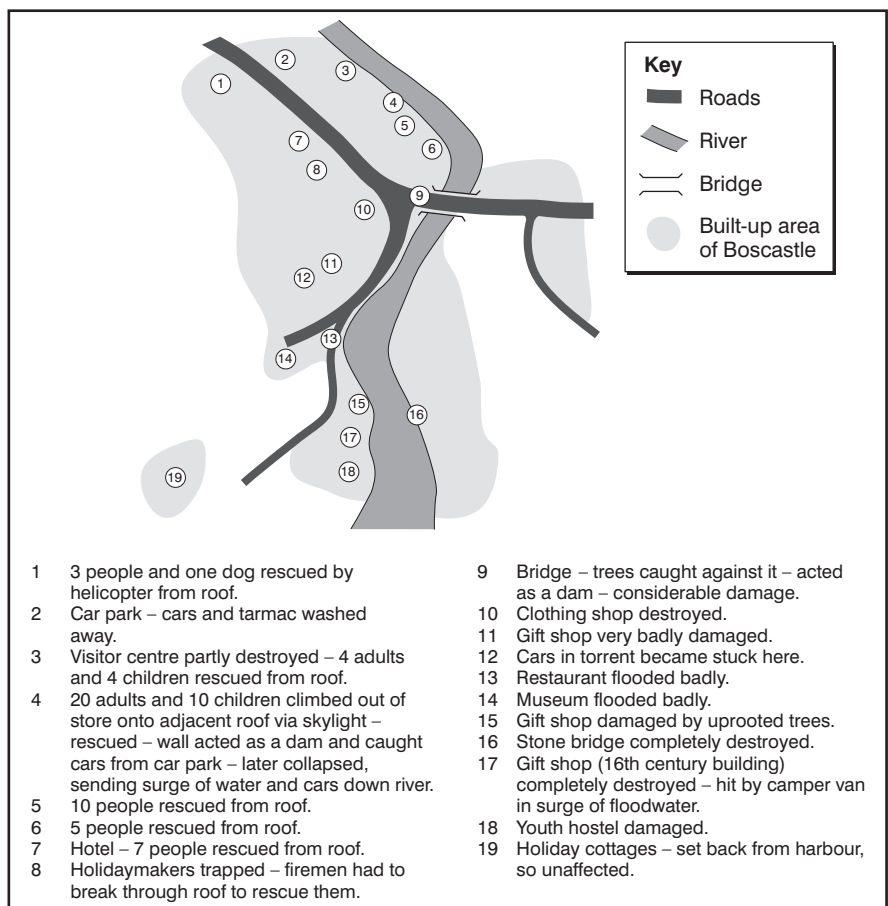
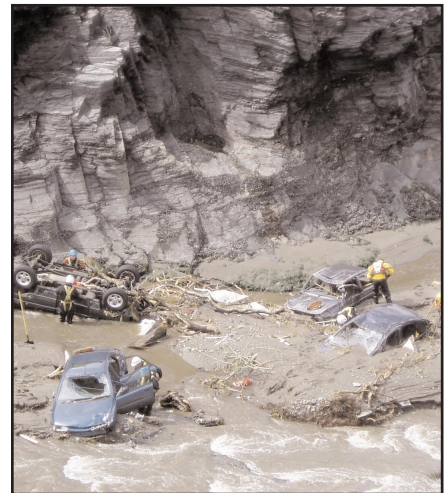


Figure 2: Cars swept away in the flood



Source: Daily Mail, 17 August 2004, p. 3

angles up and down the village main street (Figure 2).

### Emergencies during the event

One hundred and twenty people had to be winched to safety by helicopters scrambled from Cudrose, Chivenor and St. Mawgan in Cornwall, plus an extra one from Portland (further east in Dorset). The seven helicopters used made this the largest joint RAF/Royal Navy rescue since 1979. Those rescued included:

Figure 4: Key moments in the rescue operation

Time:	Event:
15:46	Call from cliff rescue team regarding rapid river level rise Concern for people around the harbour
15:51	Call to police from Boscastle resident to report floods beginning
16:02	Roads blocked and some areas cut off Coastguards seriously concerned Other emergency services requested
16:03	RAF coordination centre put on standby
16:05	2 people trapped in a car at Boscastle harbour (police report) Several people trapped (fire service report)
16:17	Port Isaac inshore lifeboat launched
16:20	Report of footbridge washed away 2 people trapped in café
16:22	Rescue helicopters scrambled
16:30	Roads into Boscastle closed (A39 & A395)
16:35	Bude inshore lifeboat launched
16:36	Air ambulance standing by to receive casualties
16:52	Flooding now reported as severe
17:16	'Major incident' message sent
17:18	3 more rescue helicopters scrambled
17:23	Coastguard declares major incident Winching operations began
17:55	Incident important enough to be placed under the control of an Assistant Chief Constable Boscastle football pitch becomes drop zone for helicopters Hospitals in Truro and Plymouth go on standby for casualties
18:00	15 people already rescued One further helicopter scrambled from Portland Naval Base
18:00–21:00	Constant use of all helicopters in rescue work
21:00	Helicopters begin to return to their bases Cliff rescue and inshore lifeboat services continue the search for casualties

- the Shute family, comprising a 15-month-old girl trapped with her parents inside and then on the roof of their vehicle at risk of being washed away. This happened seven miles from the main village site. The child was winched into the helicopter in a rucksack;
- a neighbour of the Shute family, John Statton, a farmer, swept along for almost 20 m before managing to cling on to a tree;
- several young children waiting to be rescued on the roof of a house against which several cars and trees were wedged, putting it under dangerous pressure. It could have given way at any moment, but fortunately the children were rescued;
- a woman who had severed her thumb, and a man having a heart attack

Figure 3 shows the locations of buildings from which people had to be rescued. There was heavy rain and lightning throughout the operation,

making it much more difficult and demanding.

At 3.46 p.m. in the afternoon of 16 August a member of Boscastle's cliff rescue team reported that river levels had risen by 7 feet (2.15 m) in one hour. Within another hour and a half the true severity of the event had been recognised as a helicopter pilot reported to the emergency centre at RAF Kinloss (NE Scotland), 'This is a major incident ... We require all the standby aircraft available. We are in danger of losing the people in the houses.' Helicopters worked for three hours, rescuing the 120 in need from rooftops and trees. Figure 4 shows how the operation unfolded.

During these events, coastguard teams watched the harbour in the hope of spotting anyone being washed in. About 1,000 residents and tourists were affected in total. The shops along the harbour took the worst damage. Both householders and shop owners used sandbags where possible to try to keep the water out, with mixed success.

Others tried to bail the water out, but afterwards many found their homes and belongings covered in sludge.

The fact that so many holidaymakers and daytrippers were involved made accounting for everyone extremely difficult. Some visitors had not told anyone where they were going to be for the day. Imagine going out for a drive and just deciding what you want to do during the trip – very natural. Several people's whereabouts were therefore not at all clear. Some were thought to be involved, but then turned up elsewhere. After the event, the emergency services were amazed there had been no deaths or serious injuries.

One holidaymaker's story is typical:

'We were going up the street, trying to get back to the car park from the bottom of the village. The water came up very very quickly. At first it was just a couple of inches, then we were up to our knees. The wall of the car park went and we shot into a house and up the stairs. We were stuck there for a while, then we climbed out of the attic window ... and were airlifted off by the RAF.'

*The Daily Telegraph, 17 August, 2004*

Boscastle village was not the only location affected. Several neighbouring settlements and roads were also in trouble. The local MP, Paul Tyler, was trapped in his car for a while, five miles away up the A39. The roads were heavy with traffic, caused by people realising that this was not the safest place to be. At Camelford, several miles further south and in the much larger basin of the River Camel, sandbagging of houses close to the river began as a precautionary measure. The river was flowing at bankfull. On the following day, 17 August, the Environment Agency put out serious flood warnings for other settlements further north up the Devon coast. Bude experienced almost 2 metres of floodwater.

## Damage sustained

Figure 5 shows the parts of the village that flooded. Residents were all compulsorily evacuated on Monday, 16 August. Two days later, building engineers began work to assess the safety of all buildings. From that time, residents discovered whether they could re-enter their homes and what the likely prognosis was in terms of whether or not structures were repairable. Figure 3 shows the locations of the main buildings

damaged. Many proved repairable but unoccupiable in the meantime. Residents were shown on television news going back into their homes and businesses, under supervision, to collect belongings for a stay away.

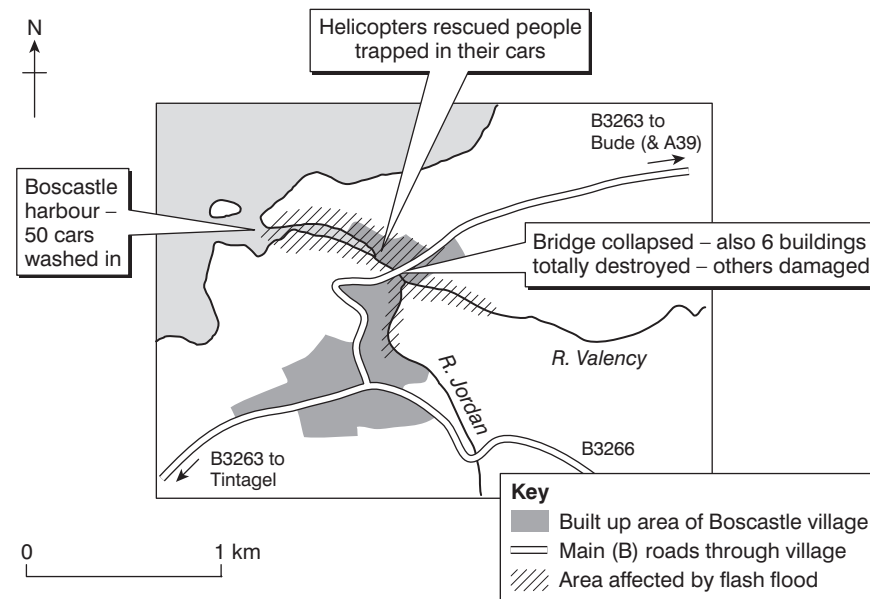
On the day following the flood, Tuesday, 17 August, the rescue operation continued at first light. Several items were found floating in the sea, as well as the 50 cars in the harbour, and these had to be checked to see whether they included fatalities or casualties. Items such as trees, fridge freezers and boilers were found, some as far as 10 miles (16 km) out to sea! Hundreds of possessions were lost.

‘Cars washed away, homes and shops devastated and dozens rescued as Cornish resort is engulfed by flood torrent.’

Front page headline, *Daily Mail*, Tuesday, 17 August, 2004

Despite this, the basic clean-up operation was completed within a few days because a large number of men and machines were committed to the task. From Wednesday, 18 August, diggers and other machines were out clearing the streets of uprooted trees, cars and other debris, despite the continued poor weather which hampered the work. This effort was encouraged by the usual visits from public figures. John Prescott (Deputy Prime Minister) and Prince Charles (Duke of Cornwall) visited the scene of devastation on the 17th and 18th respectively, followed by the press as they did so. The county council estimated the damage to bridges, ditches and other small-scale infrastructure would cost a minimum of £250,000 to rectify. Damage to buildings and businesses was estimated at several millions of pounds.

Figure 5 Main flooded areas



Adapted from *Daily Telegraph*, 17 August 2004

### Conclusion

In terms of physical causes, the Boscastle flood was a remarkably similar event to the 1952 Lynmouth flood, but on a smaller scale. Amazingly, no one was killed or even severely injured in the more recent event, which makes the Boscastle flood very different to the Lynmouth one from the human point of view.

Chance is very much a factor here – just because we have superior technology today does not mean that people will not be placed in situations beyond their control. Factors which probably did make a difference in 2004 are:

- more emergency services available;
- speed of communication to emergency services quicker;
- time of day – the Lynmouth flood occurred at night, Boscastle in the afternoon, so people were more aware and therefore more able to get out of the way.

## FOCUS QUESTIONS

1. Construct a labelled hydrograph diagram to show the likely pattern of events during the Boscastle flood.
2. This flood event was largely the product of physical factors, rather than of human ones. Choose another flood event you have studied, one which occurred in a much more urbanised basin. Compare and contrast the factors leading to the two events.
3. What are the differences in the clean-up operation and in people’s losses in MEDC floods compared with those in LEDCs?