

FLASH FLOODING

Flash floods are generally associated with short bursts of intense rainfall and are subject to location, ground conditions and the capacity of drainage infrastructure. They occur when the ground cannot absorb the water quickly enough, which can lead to drainage systems becoming overwhelmed. Some of the causes are outlined below:

Built Environment

In urban areas, hard surfaces prevent surface water from naturally infiltrating into the ground.

Features such as driveways, car parks and housing estates use impermeable materials, leading to increased surface water runoff because the water cannot seep into the ground.

Tim Evanson / Cleveland flash flood / CC BY-SA 2.0



Drainage

After a heavy rainfall event, drains can become inundated by large amounts of water in a short period of time and might not have the capacity to cope with such large volumes.

Roadside gullies are designed to keep roads free from surface water but can become covered with leaves and litter, preventing water from entering sewer systems.

Des Blenkinsopp / Drains Surcharging / CC BY-SA 2.0



Ground Conditions

When lawns and fields have been dry for long periods, the ground becomes hard, preventing surface water from percolating and causing it to run off overland. On the other hand, if the ground is saturated from previous wet weather, it cannot absorb more water, leading to significant surface water runoff.

Mike Quinn / Flooded pastures above Anton Hill Farm / CC BY-SA 2.0



Topography

A large area might receive the same amount of rainfall, but flooding will occur only in specific places. This happens because water runs downhill to lower ground, where it collects and pools. This rise and fall of the land, known as topography, determines how water flows and where it accumulates, guiding drainage to common outlets.

Malcolm Campbell / Flash Flood / CC BY-SA 2.0



CASE STUDY: Poynton, Cheshire

On the 31st July 2019, numerous homes and businesses were affected by flash flooding in Poynton as heavy and intense rainfall hit the area, overwhelming drains which caused Poynton Brook to overtop. Homes, businesses and infrastructure were flooded and damaged by the floodwater. A major incident was declared and many homes were evacuated as nearly a month's worth of rain (~2 inches) fell in just 24 hours. Poynton Fire Station responded to more than 20 incidents over a four hour stretch including rescuing at least 11 people from floodwater. Roads were closed, including the new £290 million A555 dual carriageway, where two cars were abandoned and 800,000 litres of water had to be pumped away.