



## US Geological Survey - What is a sinkhole?

A sinkhole is a depression in the ground that has no natural external surface drainage. Basically this means that when it rains, all of the water stays inside the sinkhole and typically drains into the subsurface.

Sinkholes are most common in what geologists call, "karst terrain." These are regions where the types of rock below the land surface can naturally be dissolved by groundwater circulating through them. Soluble rocks include salt beds and domes, gypsum, and limestone and other carbonate rock. Florida, for instance, is an area largely underlain by limestone and is highly susceptible to sinkholes.

When water from rainfall moves down through the soil, these types of rock begin to dissolve. This creates underground spaces and caverns.

Sinkholes are dramatic because the land usually stays intact for a period of time until the underground spaces just get too big. If there is not enough support for the land above the spaces, then a sudden collapse of the land surface can occur.

Find more information about sinkholes at the [USGS Water Science School](#).



## Sinkholes



[Sinkhole at Magdalen's Close, Ripon, Monday 17 February 2014](#) Dr Anthony Cooper, gives an account of the most recent sinkhole to appear in the Ripon area.





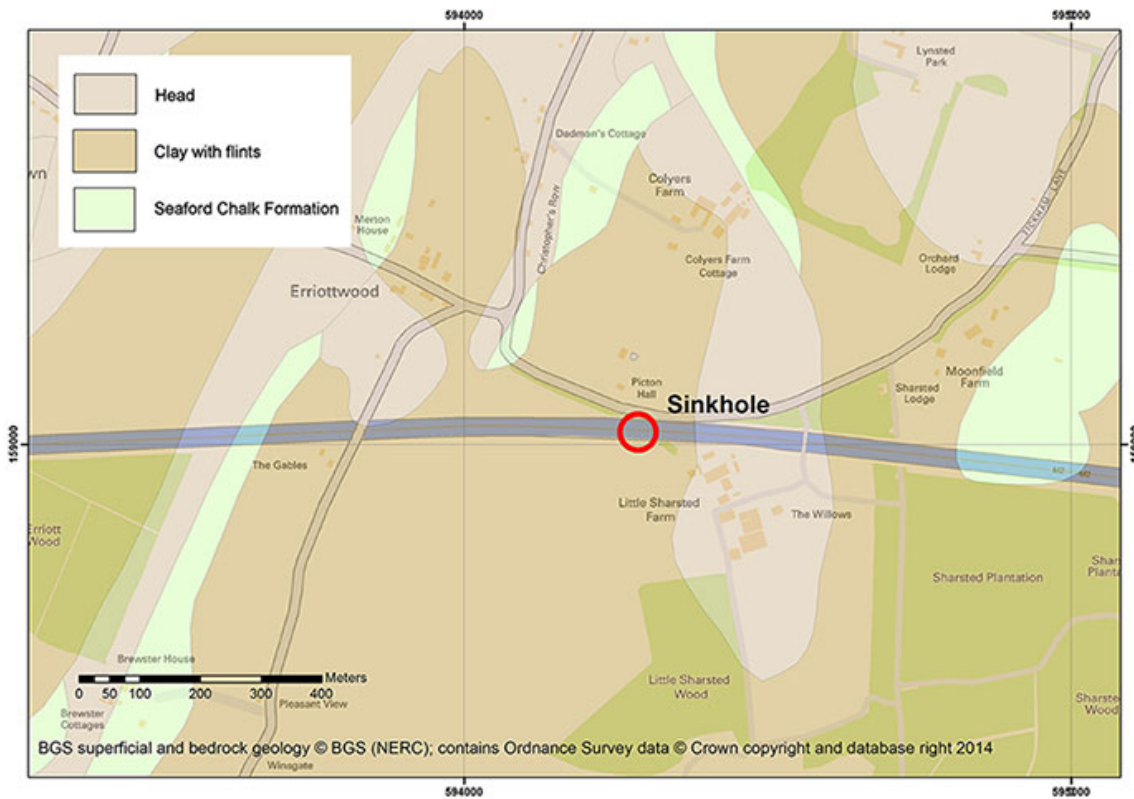
Sinkhole over gypsum, Sutton Howgrave, North Yorkshire, c. 2001.



Sinkholes formed on Chalk due to a burst water pipe at Fontwell, Sussex. © Sealand aerial photography.



[‘Sinkhole’ in the middle of the M2: February 2014](#)



[Increased incidence of sinkholes and subsidence collapse features in 2014](#)

The sustained period of wet weather is suspected to be the trigger for the recent spate of sinkholes and collapse subsidence features that have been reported in the south and south-east.



Collapse of four garages into subsidence hollow caused by the dissolution of gypsum at Ripon, North Yorkshire, 1997.



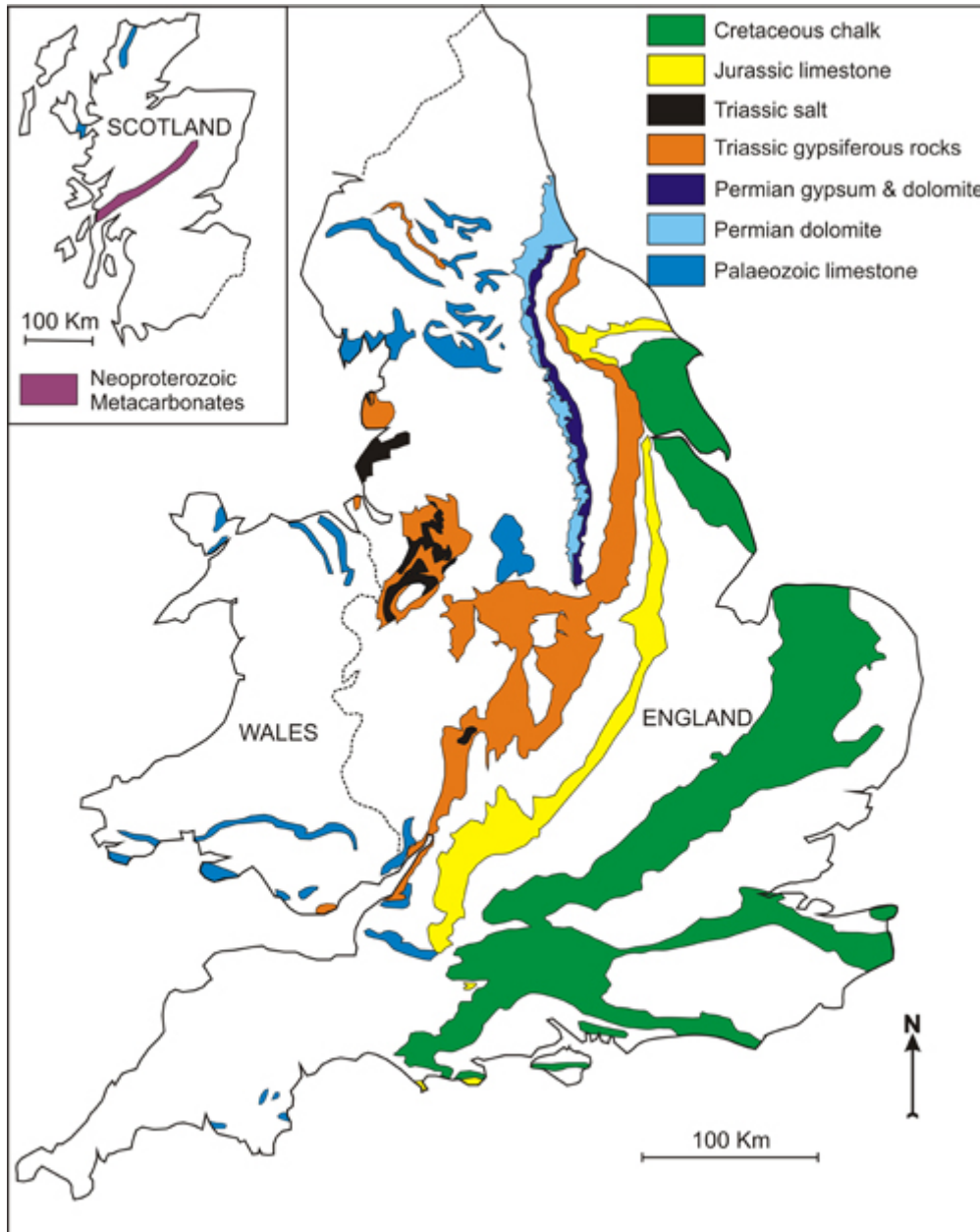
[Caton Karst, Devon Monday 6 June 2016](#) An account of the most recent sinkhole to appear in the Devon area.



[Deneholes](#)

An example of how ancient mine workings can lead to collapse subsidence.





Soluble rocks in the UK.

The study of sinkholes has attracted considerable media attention since the tragic death of a man at Seffner near Tampa, Florida, on 1 March 2013 — [Sinkhole swallows up Florida man Jeffrey Bush | BBC News](#)

A sinkhole, that had formed beneath Mr Bush's house, 'swallowed' him when the house floor collapsed.

Later in March 2013, a golfer was injured when a sinkhole [opened up on the fairway](#) of an Illinois golf course.

## Recent events

Increased incidence of sinkholes and collapse subsidence features:

## What causes sinkholes and where do they occur in the UK?

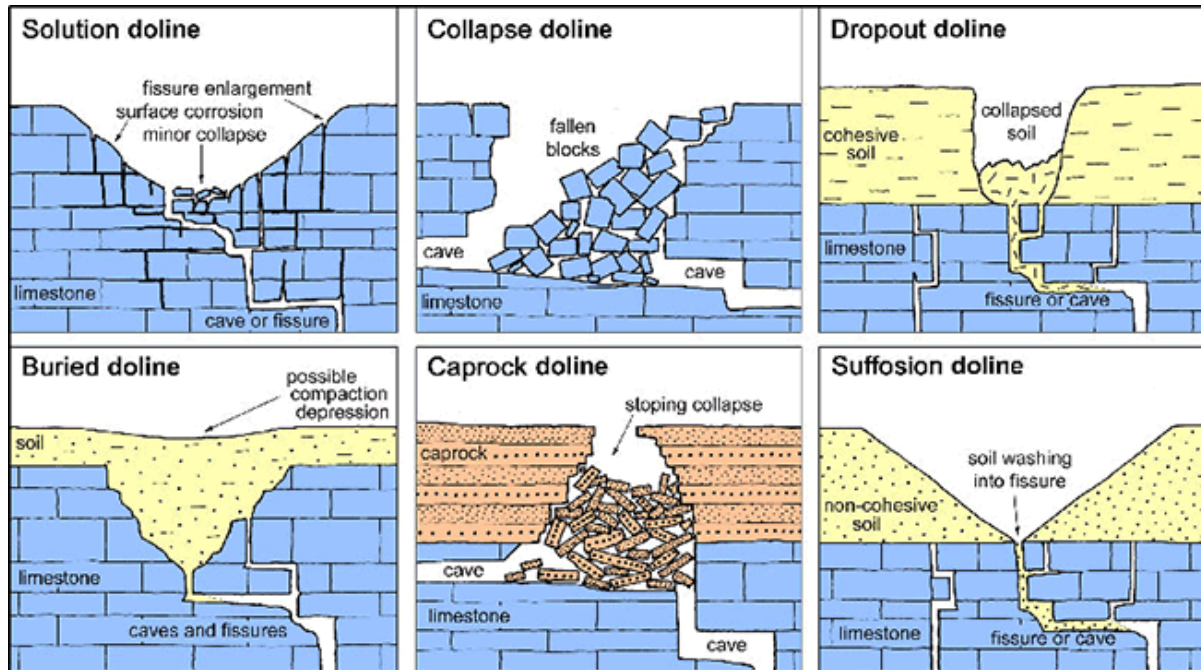
There are several different types of sinkhole — sometimes called dolines:

Some result from the surface dissolution of the **soluble rock** (solution sinkholes) — for example limestone rocks dissolve when attacked by rainfall or groundwater that is acidic.

Sinkholes also occur where a thin covering of loose superficial material such as sand, clay or soil covers the soluble rocks beneath. In this setting, the soil can be washed into solutionally widened fissures below, leading to the development of a cavity within the overlying material.

If the cover material is sandy, it will tend to gradually slump into the fissures, slowly creating a sinkhole over time (suffosion sinkhole).

However, if the material is more cohesive, like clay, then the cavity can grow quite large before suddenly collapsing; a process termed a 'drop out' sinkhole. It is these more spectacular collapses that sometimes hit the headlines.



Modified from the BGS [Engineering Geology \(Superficial\)](#) map of the UK, 2011; adapted from Waltham, A C, Bell, F G and Culshaw, M G. 2005. Sinkholes (or dolines) and subsidence: karst and cavernous rocks in engineering and construction. Springer Berlin.