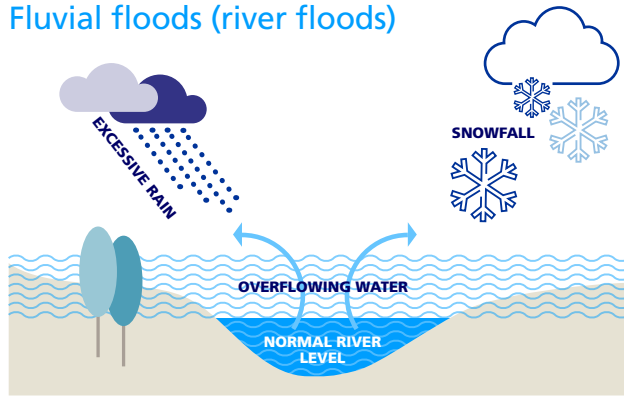


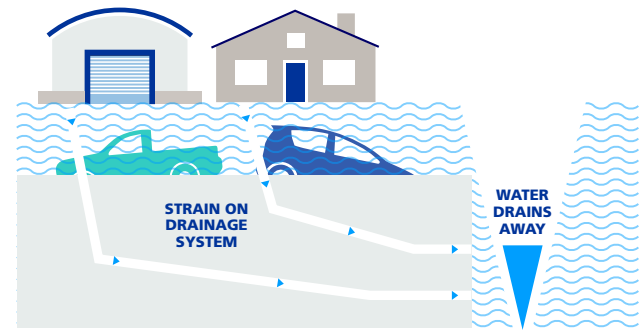
# Four common types of flood explained

A flood is an overflow of a large amount of water beyond its normal limits, especially over what is normally dry land. To plan for floods, you need to understand the type – or types – of flood you may face. Why? There are several different kinds of flood, and each one bears a different impact in terms of how it occurs, how it is forecast, the damage it causes, and type of protection you need. **Shown here are the four main types of flood.**

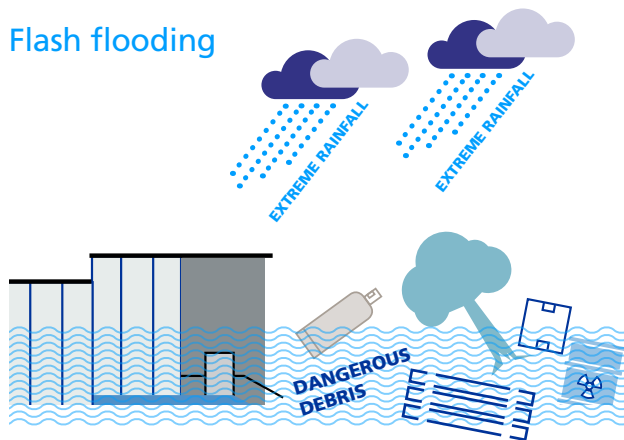
## Fluvial floods (river floods)



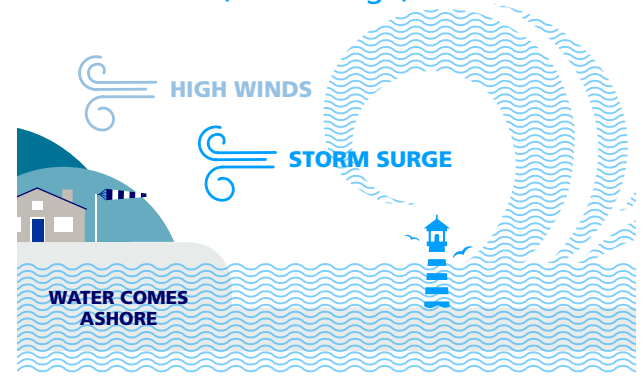
## Pluvial floods (surface water floods)



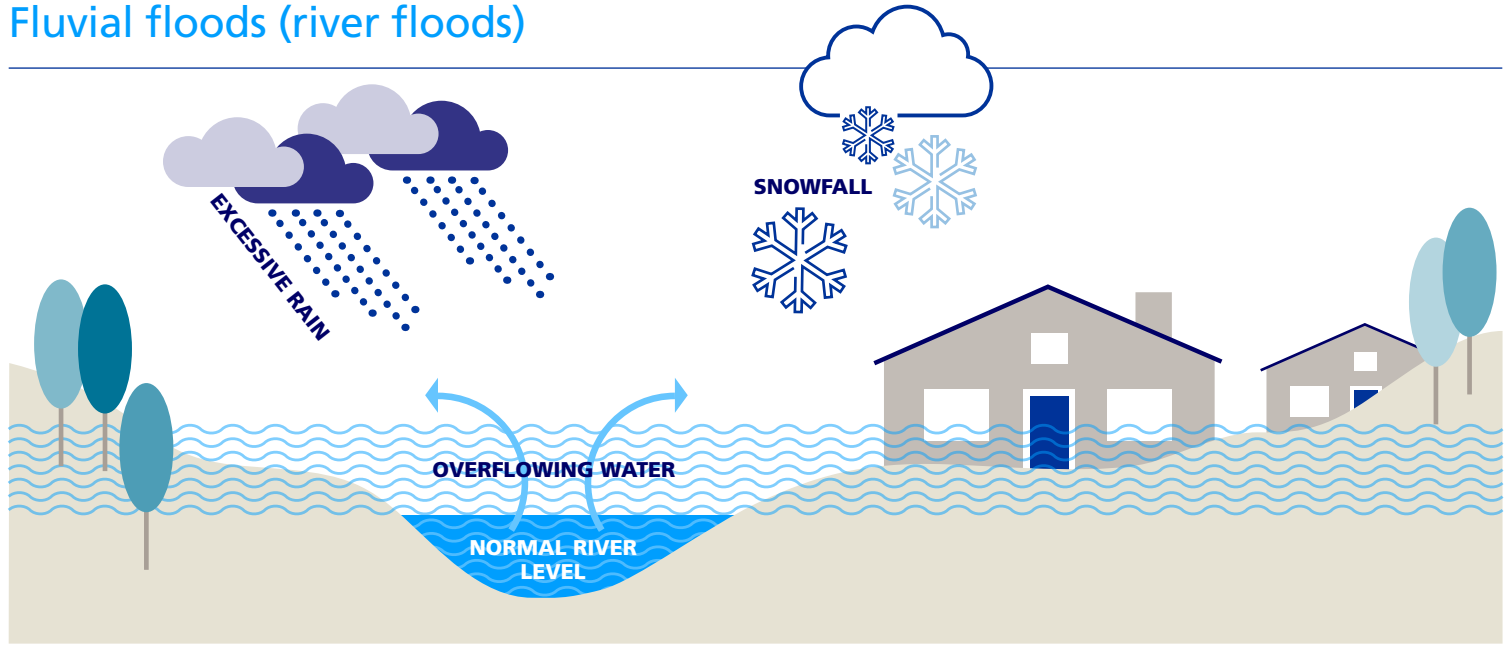
## Flash flooding



## Coastal flood (storm surge)



## Fluvial floods (river floods)



A fluvial, or river flood, occurs when the water level in a river, lake or stream rises and overflows onto the surrounding banks, shores and neighboring land. The water level rise could be due to excessive rain or snowmelt.

The damage from a river flood can be widespread as the overflow affects smaller rivers downstream, which can cause dams and dikes to break and swamp nearby areas.

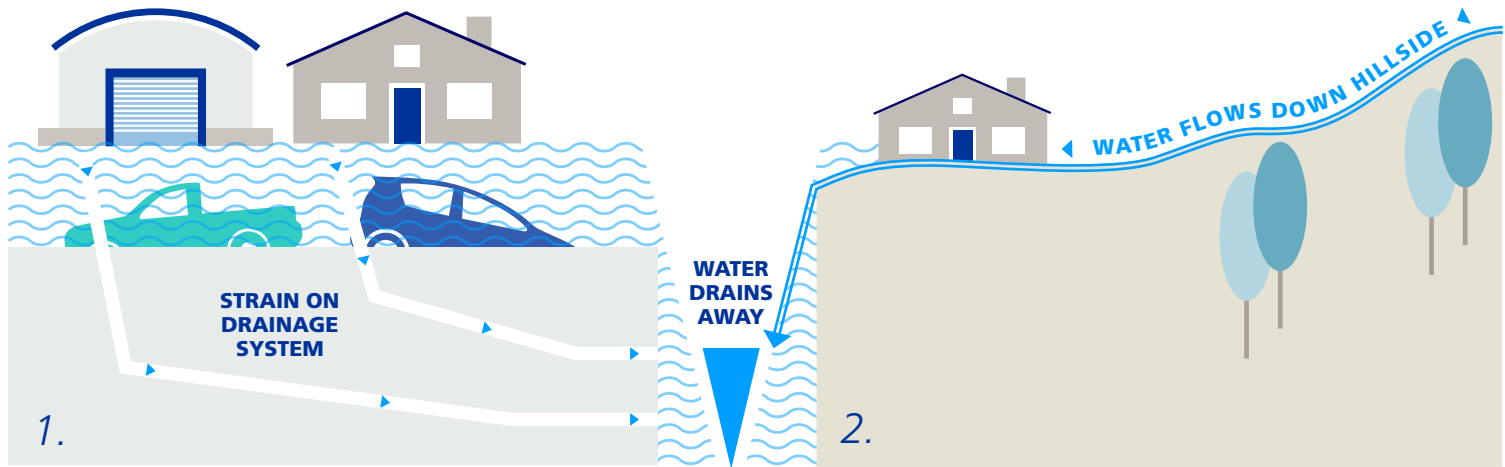
The severity of a river flood is determined by the duration and intensity of rainfall, i.e. the amount

(volume) of rainfall in an area. Other factors include soil water content due to previous rainfall, and the terrain surrounding the river system. In flatter areas, floodwater tends to rise more slowly and be shallower, and it often remains for days. In hilly or mountainous areas, floods can occur within minutes after a heavy rain, drain very quickly, and cause damage due to debris flow.

To determine the probability of river flooding, models consider past precipitation, forecasted precipitation, current river levels, and well as soil and terrain conditions.

## Pluvial floods (surface water floods)

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A pluvial, or surface water flood, occurs when heavy rainfall creates a flood independent of an overflowing water body. A common misconception about flood is that you must be located near a body of water to be at risk. Yet pluvial flooding can happen in any location — urban or rural — even in areas with no water bodies in the vicinity. There are two common causes of pluvial flooding:

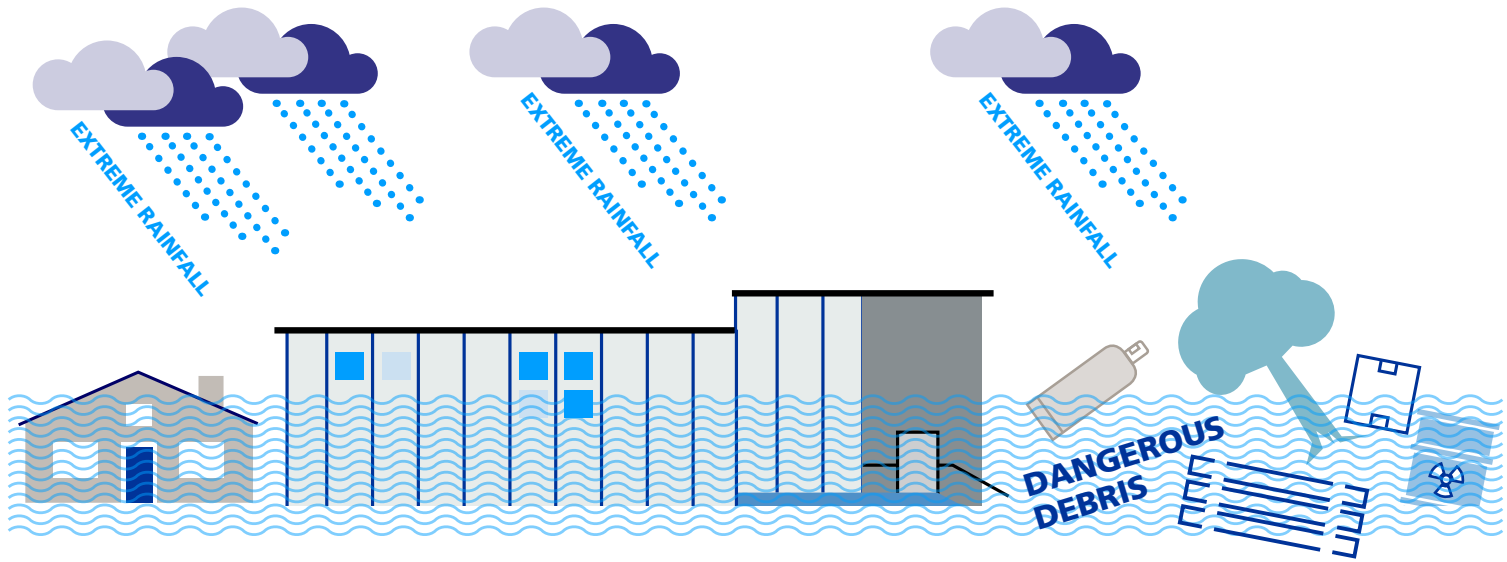
1. *Intense rain saturates an urban drainage system. The system becomes overwhelmed and water flows out into streets and nearby structures.*

2. *Run-off or flowing water from rain falling on elevated terrain, e.g. hillsides, that are unable to absorb the water. Hillsides with recent forest fires are notorious sources of pluvial floods, as are areas where the natural ground has been paved.*

Pluvial floods occur gradually, which provides people time to go indoors or leave the area. The level of water is low to the ground (rarely more than one meter) and causes no immediate threat to lives. However depending on the flooded area it may cause significant economic damage.

## Flash flooding

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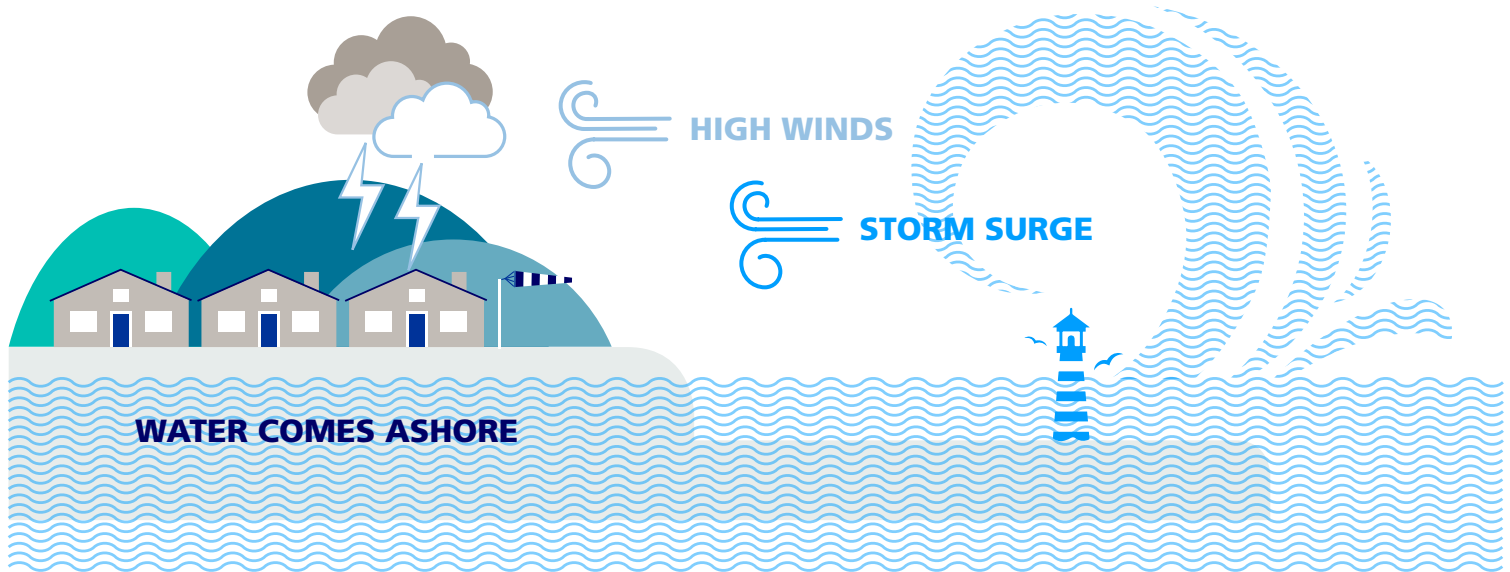
Flash floods are caused by extreme rainfall events or the sudden release of water over a short period of time. They occur within minutes to hours after a heavy rain event, and produce raging torrents of water that move with great speed. While the majority of flash floods are triggered by torrential rain falling within a short amount of time (like during intense storms), they can also occur even if no rain has fallen via sudden release of water from a levee, damage to a dam or by a sudden release of a debris or ice dam upstream.

Flash floods are very dangerous and destructive not only because of the force of the water, but also the hurtling debris that is often swept up in the flow. Understanding the process of flash floods and where they occur can reduce the human toll and cost to property, and reduce risks for first responders.

You can learn more in Zurich's report *'Flash Floods: The underestimated natural hazard'*.

## Coastal flood (storm surge)

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Coastal flooding is the inundation of land areas along the coast by seawater. Common causes of coastal flooding are high tide, tsunamis and storm surge.

Storm surge is created when high winds from a windstorm push water onshore — this is the leading cause of coastal flooding and often the greatest threat associated with a windstorm. In this type of flood, water overwhelms low-lying land and often causes devastating loss of life and property.

The severity of a coastal flood is determined by several factors, including the strength, size, speed, and direction of the windstorm. The onshore and offshore topography also plays an important role. To determine the probability and magnitude of a storm surge, coastal flood models consider this information in addition to data from historical storms that have affected the area.