



FLOODS

THE DEVASTATING FORCE OF WATER

Overview

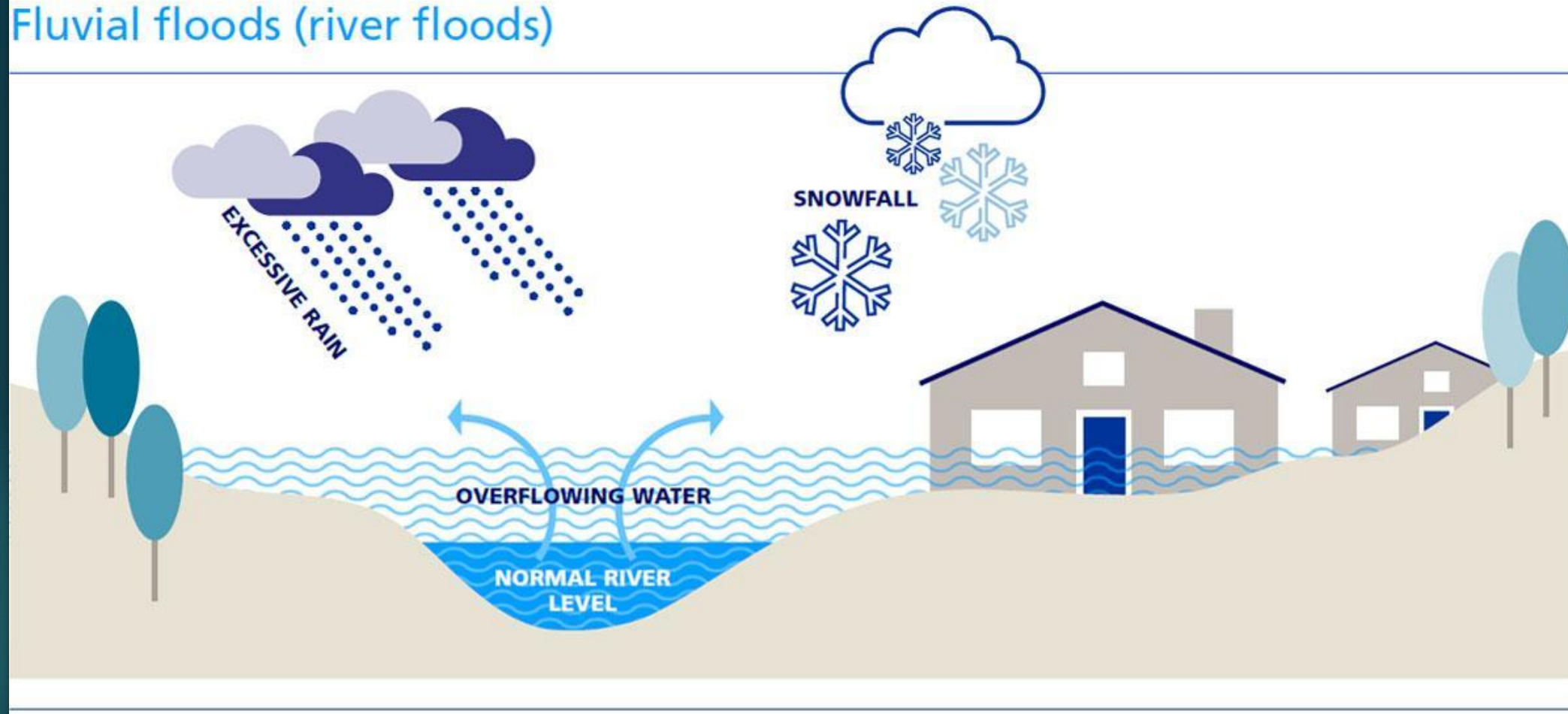
- ▶ Definition
- ▶ Types of floods
- ▶ History of floods in Poland
- ▶ How to prevent floods...
- ▶ ...and how to deal with them
- ▶ A short quiz



What is a flood?

A FLOOD IS AN OVERFLOW OF WATER THAT SUBMERGES LAND THAT IS USUALLY DRY. FLOODING MAY OCCUR AS AN OVERFLOW OF WATER FROM WATER BODIES, SUCH AS A RIVER, LAKE, OR OCEAN, IN WHICH THE WATER OVERTOPS OR BREAKS LEVEES, RESULTING IN SOME OF THAT WATER ESCAPING ITS USUAL BOUNDARIES, OR IT MAY OCCUR DUE TO AN ACCUMULATION OF RAINWATER ON SATURATED GROUND.

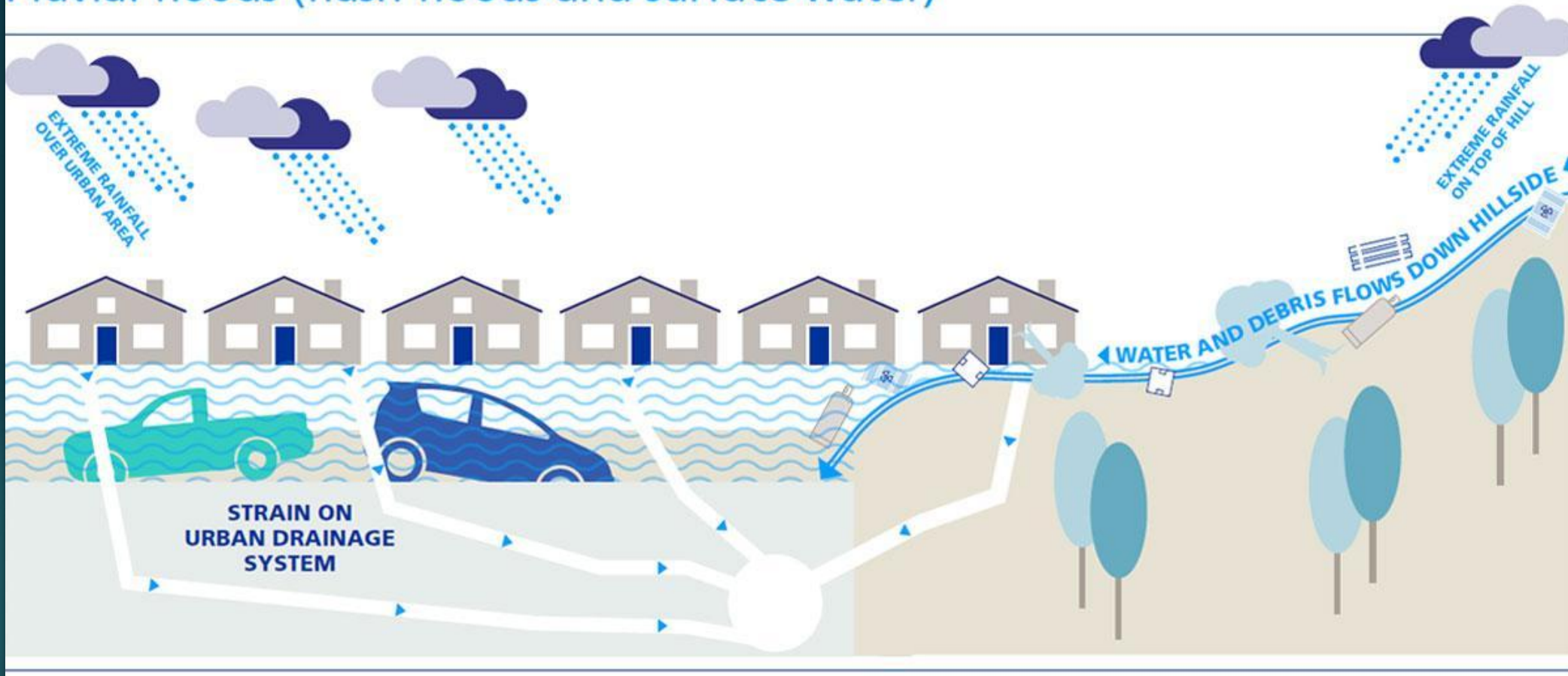
Fluvial floods (river floods)



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 NEIGHBOURING 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..

Pluvial floods (flash floods and surface water)

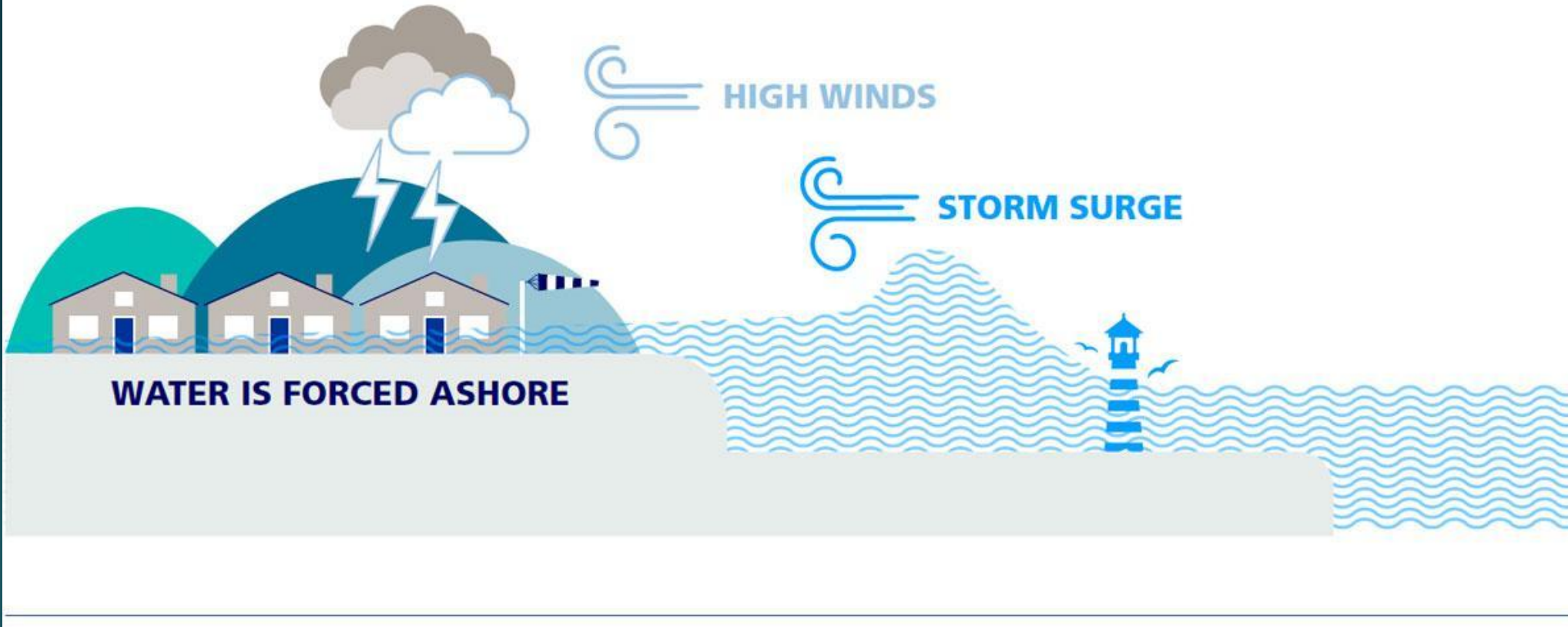


A PLUVIAL FLOOD OCCURS WHEN AN EXTREME RAINFALL EVENT CREATES A FLOOD INDEPENDENT OF AN OVERFLOWING WATER BODY. A COMMON MISCONCEPTION ABOUT FLOOD IS THAT YOU MUST BE LOCATED NEAR A BODY OF WATER TO BE AT RISK. YET PLUVIAL FLOODING CAN HAPPEN IN ANY LOCATION, URBAN OR RURAL; EVEN IN AREAS WITH NO WATER BODIES IN THE VICINITY. THERE ARE TWO COMMON TYPES OF PLUVIAL FLOODING:

The Two Types of Pluvial Flooding:

- ▶ Surface water floods occur when an urban drainage system is overwhelmed and water flows out into streets and nearby structures. It occurs gradually, which provides people time to move to safe locations, and the level of water is usually shallow (rarely more than 1 meter deep). It creates no immediate threat to lives but may cause significant economic damage.
- ▶ Flash floods are characterized by an intense, high velocity torrent of water triggered by torrential rain falling within a short amount of time within the vicinity or on nearby elevated terrain. They can also occur via sudden release of water from an upstream levee or a dam. 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.

Coastal flood (storm surge)



COASTAL FLOODING IS THE INUNDATION OF LAND AREAS ALONG THE COAST BY SEAWATER. COMMON CAUSES OF COASTAL FLOODING ARE INTENSE WINDSTORM EVENTS OCCURRING AT THE SAME TIME AS HIGH TIDE (STORM SURGE), AND TSUNAMIS.

Floods in Poland

The two largest floods of the twentieth century in Poland were the 1934 and 1997 floods.

In 1934 it began with a heavy rainfall between the 13th and 17th of July. The rainfall caused the water level to raise in many of Poland's river, which have overflowed as a result. The flood covered 1260 square kilometres, destroying 22 thousand buildings, 167 kilometres of roads and 78 bridges. The cost of damages was established at 250 million dollars. 55 people lost their lives.

In 1997 came the worst flood that has ever struck Poland, and has thereafter been called the flood of the millennium. The rainfall took place between the 4th and 8th of July. The situation from 1934 repeated itself with even more catastrophic results. In some areas the rainfall in the course of three days equalled the amount that would normally take 2 months. The damages were calculated at 3 billion dollars. 56 people lost their lives that year.















Flood prevention and management

Dam - a barrier that stops or restricts the flow of surface water or underground streams. Reservoirs created by dams not only suppress floods but also provide water for activities such as irrigation, human consumption, industrial use, aquaculture, and navigability.



Flood prevention and management

River Defense - In many countries, rivers are prone to floods and are often carefully managed. Defenses such as levees, bunds, reservoirs, and weirs are used to prevent rivers from bursting their banks.



Flood prevention and management

Coastal Defense - defence against flooding and erosion, and techniques that stop erosion to claim lands. Protection against rising sea levels in the 21st century is crucial, as sea level rise accelerates due to climate change. Changes in sea level damage beaches and coastal systems are expected to rise at an increasing rate, causing coastal sediments to be disturbed by tidal energy.



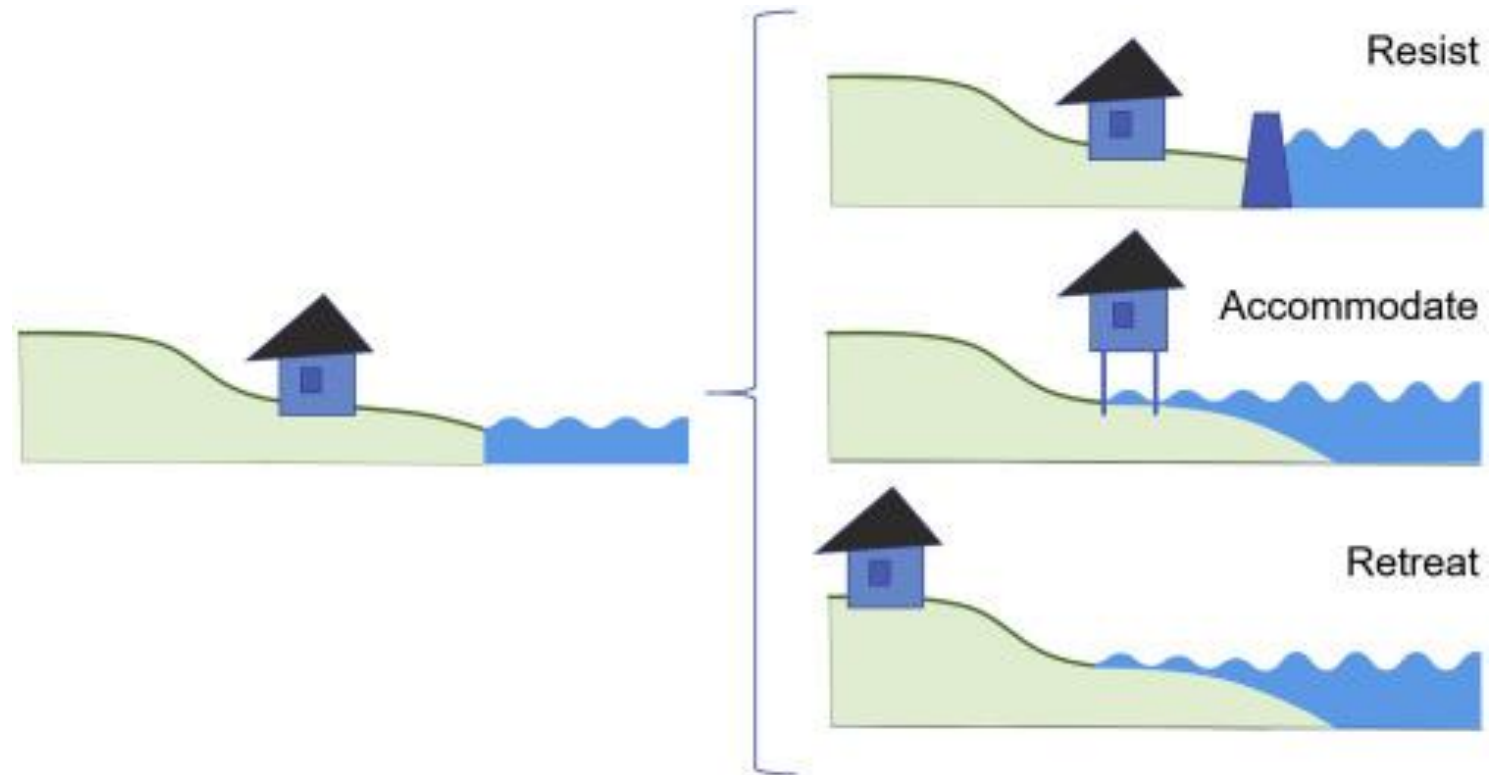
Flood prevention and management

Strategic retreat

One way of reducing the damage caused by flooding is to remove buildings from flood-prone areas, leaving them as parks or returning them to wilderness.

Resilience

Buildings and other urban infrastructure can be designed so that even if a flood does happen, the city can recover quickly, and costs are minimized. For example, homes can be put on stilts, electrical and HVAC equipment can be put on the roof instead of in the basement, and subway entrances and tunnels can have built-in movable water barriers.



Thank you for your attention 😊

Sources:

- ▶ [Wikipedia.org](https://www.wikipedia.org)
- ▶ [Zurich.com](https://www.zurich.com)
- ▶ [Sciencedirect.com](https://www.sciencedirect.com)