# Measures against Storm and Flood Disasters

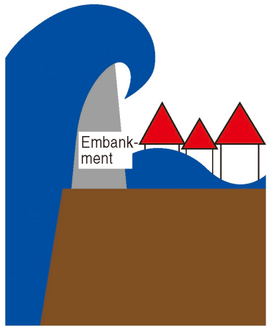
"Storm and flood disasters" refers to the types of natural disasters caused by strong wind, heavy rain, flooding, etc., which bring major damage nationwide every year. To protect ourselves from such natural disasters, we need to have correct knowledge about various natural phenomena, recognize them as familiar danger to ourselves, and learn the actions to take in the event of disasters at ordinary times.

## About flood disaster

As global warming progresses, the annual number of heavy rain occurrences (over 80mm rainfall per hour) is increasing. The frequency of such heavy rain and hard rainfall in a short period of time is expected to increase in the future.

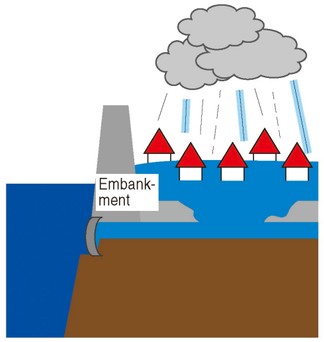
### River flooding

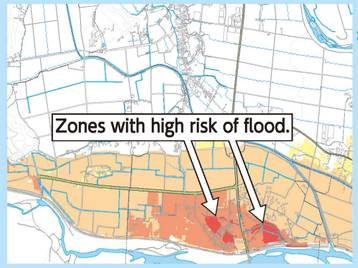
Inundation caused by river water overflowing from or demolishing embankments, flooding houses and farmland. When river flooding occurs, a large amount of water flows in and floods a wide area and takes a long time to subside.

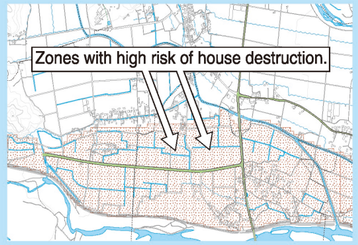



### Inland flooding

Flooding of buildings, land, and roads in urban areas caused by rainwater overflowing from gutters and drainage channels. Caution needed since flooding could start soon after the start of rainfall.



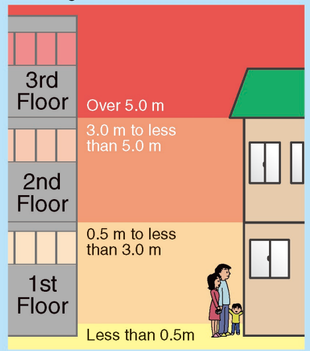

### Legend for Storm and Flood Damages indicated on the Map

Flood Damage Zones prone to inundation (inundation height)

**(1) Is the living space higher than the inundation height?**

**(2) Is the residence included within the Building Destruction and Flooding Expected zone?**

If these two points can be confirmed, it may be possible to secure safety by staying home despite the danger of inundation.




Wooden buildings may collapse due to the fast flow velocity.

The entire structure of the building may fall due to land erosion.

## Evacuation flow

**Rainfall starts**

**Where to?**

- The nearest designated emergency shelter within walking distance.
- Safer places such as houses of relatives or friends.

**Begin evacuation at an early stage.**

Those who need more time to evacuate should start evacuation at the "Evacuation of elders and others" stage.

In principle, evacuate on foot.

**If "Evacuation order" is issued, everyone evacuates.**

Even if low in depth, the inundation can be dangerous if the flow speed is fast.

Be extra cautious in low places such as the underpass of a viaduct.

Even a few tens of centimeter-deep water could create enough pressure to make the door impossible to open.

Water is muddy.
Lids of manholes and gutters could be off, causing more invisible dangers.

**Disaster occurs**

**To the safest possible place from that location at that moment.**

**If failed to evacuate... Where to?**

- The highest spot in your house.
- The tallest building in the near-by area.

Evacuate to the higher floor of the building to protect yourself from the flood.

## Strength and falling styles of rain

**Slightly heavy rain**
Above 10 mm to less than 20 mm
Hard to converse because of the sound of rain.

●Raining continuously

**Heavy rain**
Above 20 mm to less than 30 mm
Hard to see through the windshield even with the wipers activated. Gutters, sewers, and minor rivers start to overflow.

●Downpour

**Heavy rain**
Above 30 mm to less than 50 mm
Possibility of landslides and cliff collapse rises, and preparation to evacuate necessary in dangerous zones.

●Raining buckets

**Extremely heavy rain**
Above 50 mm to less than 80 mm
Water spurts out from manholes. Mudslides likely to happen. Much disaster damage occurs.

●Raining like a waterfall

**Torrential rain**
Above 80 mm
Large-scale rain disaster most likely to happen, strict precautions necessary.

●Feels fearful
●Has sense of pressure that makes it almost hard to breathe

## Strength of the wind and how it blows

**Above 10 m/s to less than 15 m/s**
Becomes hard to walk against the wind or hold an umbrella open.

**Above 15 m/s to less than 20 m/s**
Impossible to walk against the wind, people start to fall down.

**Above 20 m/s to 25 m/s**
Will fall unless body is secured. Things start to get blown off by wind and hit and break window glass.

**Above 25 m/s**
Impossible to keep standing. Outdoor activities become highly dangerous.
Trees uprooted.

## Typhoon

Many typhoons approach and land in Japan annually, often causing severe damage.
When a typhoon is expected to approach, pay attention to typhoon information and be prepared to avoid damage.

| Scale | Wind speed over 15 m/s radius |
|---|---|
| Large (big) | Above 500 km to less than 800 km |
| Super large (extremely big) | Above 800 km |

| Strength | Maximum wind speed |
|---|---|
| Strong | Above 33 m/s to less than 44 m/s |
| Very strong | Above 44 m/s to less than 54 m/s |
| Severe | Above 54 m/s |

**Advisory for gale/warning for storm**

Advisory for gale:
When average wind speed is 11 m/s
Warning for storm:
When average wind speed is 20 m/s

**Advisory for heavy rain**

When damages caused by heavy rain is expected.
- Surface rainfall index standard 9
- Soil rainfall index standard 94

**Warning for heavy rain**

When serious disaster is expected to happen due to heavy rain.
- Surface rainfall index standard 25
- Soil rainfall index standard 146

Record-setting short-time deluge
100 mm rainfall in 1 hour

In addition to above, advisory and warning for flood will be issued.