

1 What is a natural disaster?

Kofu city flood hazard map Table of Contents

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1-1. About Kofu city flood hazard map

The "Kofu City Flood Hazard Map" shows the inundation depth of each floodplain of the targeted rivers as the worst damage expected when the largest possible rainfall occurs and the banks of each river break. The map also shows the locations of the designated evacuation centers.

Kofu City issued its first "Kofu City Flood Hazard Map" in 2019. However, the city has issued the revised version of it due to the frequency and intensification of recent flood disasters throughout Japan.

There is a possibility that more targeted rivers which show predicted flood inundation areas would be added to Kofu City Flood Hazard Map in future. For the latest information about the predicted flood inundation areas, please check the Kofu City's website.

	This map	Previous map (created in 2019)
Targeted rainfall	Estimated maximum rainfall	Estimated maximum rainfall
Targeted rivers	For 10 rivers, namely The Fuefuki River, The Kamanashi River, The Arakawa River, The Aikawa River, The Nigori River, The Byodo River, The Takido River, The Sakai River, The Kamata River and The Kugawa River	For the 8 rivers, namely The Fuefuki River, The Kamanashi River, The Arakawa River, The Aikawa River, The Nigori River, The Byodo River, The Takido River, and The Sakai River

What is a flood hazard map?

According to the Flood Control Act, the national and prefectural governments shall mark-off flood inundation areas, and municipalities shall create flood hazard maps that describe flood forecast transmission methods and evacuation facilities on the flood inundation area map.

Inundation may occur outside the flood inundation area indicated on the flood hazard map, or the estimated inundation depth may differ from the actual inundation depth. However, in the heavy rains of July 2018, which became a record heavy rain mainly in western Japan, there are cases where its effectiveness was shown, such as the fact that the flood inundation area and the actual inundation area almost match in Mabi-ku, Kurashiki City, Okayama Prefecture.

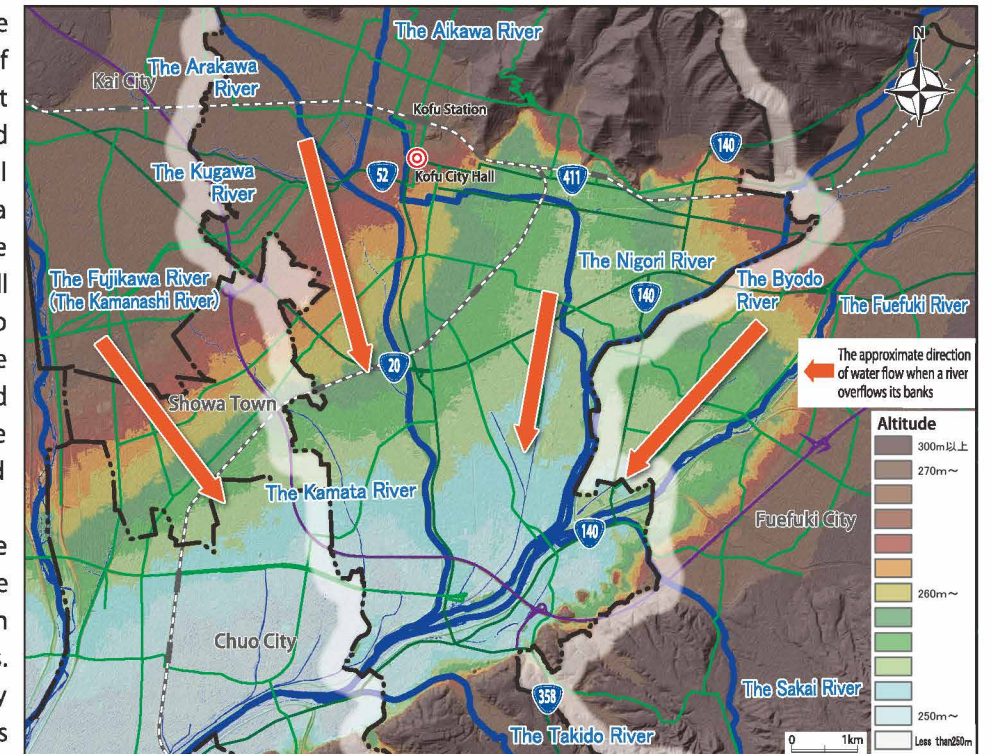
Read this map and find out the predicted water level in your area in the event of flooding and identify the location of the nearest evacuation center.



1-2. Geographical reasons behind the disasters affecting Kofu city

The Kofu basin, located between the mountains in the north and south of the city, is formed by many different rivers including The Fuefuki River and The Kamanashi River. The natural conditions of the basin make it a particularly flood-prone area. The small- and medium-sized rivers as well as the city drainage water tend to suddenly overflow inundating the low-lying areas due to concentrated heavy downpours as well as the basin's steep inclination and development of land for housing lots.

The figure on the right shows the topography of the Kofu basin and the approximate water flow directions in case the rivers overflow their banks. When flooding occurs, stay away from the river and evacuate as far as you can.



1-3. Past disasters in Kofu City

Isolated heavy rains September 11 and 12, 2000	The rain front which stayed over Honshu from September 11 to 12, 2000, became active due to warm and moist air of Typhoon No. 14 and it caused heavy rain over a wide area throughout the country. This torrential rain caused the 24-hour precipitation amount of rain in Kofu City to reach 294.5 mm, which was the highest record since the observation started by the Kofu Local Meteorological Office. (The rainfall total reached 311 mm since the 11th) (Kofu City Disaster Control Teams were set up on September 12 and 13)	Completely destroyed houses: 1 house Partially destroyed houses: 4 houses Inundation above floor level: 106 houses; Inundation below floor level: 273 houses Flooding above floor level in non-residential building: 58 buildings Flooding below floor level in non-residential building: 26 buildings Flooded field, etc.: 91 ha Forest damage: 18 sites Damage to woodland paths: 9 paths, 16 locations Flooded roads: 18 locations Evacuated households: 16 households, 51 people, etc.
Typhoon no. 23 October 20 and 21, 2004	Typhoon No. 23 made landfall in Kochi Prefecture on the afternoon of October 20th, moving north. It passed Kofu City around 11:30 pm on the same day. When the typhoon approached the city around 3:00 pm, it caused heavy rains. The rain stopped around 10:00 pm on the 20th. The rain fall total reached 192 mm between 7:00 am on the 19th to 9:00 am on the 21st. The heavy rain caused landslides in Zenkojimachi area, and caused flooding above and below floor level in Satogaki and Tamamoro areas. (Kofu City Disaster Control Teams were set up on October 20 and 21)	Half-destroyed houses: 1 house Inundation above floor level: 58 houses; Inundation below floor level: 228 houses Flooding above floor level in non-residential building: 22 Flooding below floor level in non-residential building: 21 Submerged rice fields, etc.: 4.89 ha; Forest damage: 3 locations Damage to woodland paths: 1 location Evacuated households: 75 households, 170 people, etc.
Typhoon no. 19 October 12 and 13, 2019	Typhoon No. 19, which occurred near Minami-torishima Island on October 6, turned into a violent storm on October 7. After it made landfall in the Izu Peninsula before 7:00 pm on the 12th, it passed the Kanto region, and escaped toward east in Tohoku region in the early morning of the 13th. It started raining in Yamanashi Prefecture from the night of the 10th. In Furuseki, the rain turned into extremely violent. The rain fall total reached 52.4 mm per an hour. Also, its maximum sustained wind speed recorded 21.2 m/s, causing a stormy rain in Kofu City. (Kofu City Disaster Control Teams were set up on October 12 and 13)	Partial destruction: 15 buildings Evacuated households: 571 households, 1,270 people, etc.



Concentrated heavy rains on September 12, 2000 (Flooding of The Fujikawa River, a tributary of The Nigori River)



Typhoon No. 23 on October 21, 2004 (Flooding of The Takakuragawa River, a tributary of The Nigori River)

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2 Make an evacuation plan

3 Be prepared for disasters

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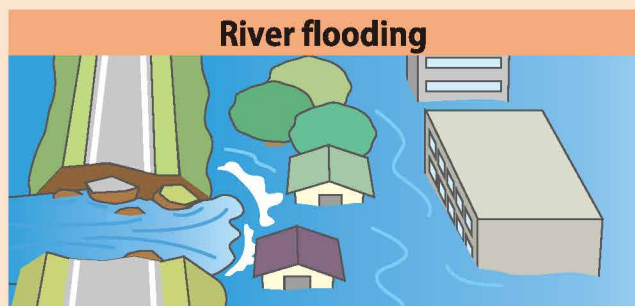
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1-4. Inland flooding and river flooding

The flood-prone areas in Kofu City Flood Hazard Map shows the predicted affected areas when the rivers bursts their banks. This is called "River flooding". On the other hand, Inland flooding can occur when the volume of water on land exceeds the capacity of drainage systems and sewer systems.

Even in such case that neither a river bursts its banks nor breaks its banks, water overflowing from waterways or sewer systems can cause flood damages. Not only areas near a river, also lowland areas, depressions and underground malls are, especially, at high risk of flood damages. Check the height above sea level of your current location to protect yourself from flooding.







River flooding
River flooding can occur when the water overflows its bank or the water bursts its bank from longer-lasting rainstorms.



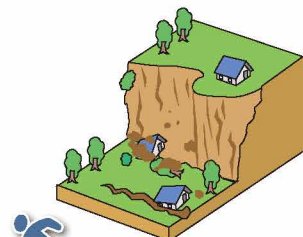
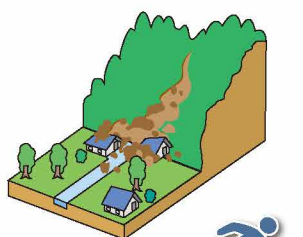
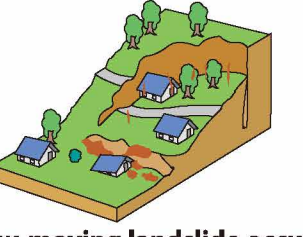
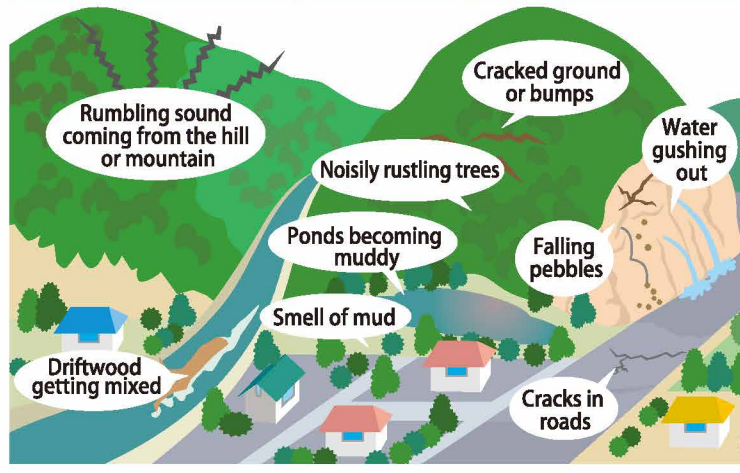
Inland flooding
Inland flooding can occur when the volume of water on land exceeds the capacity of natural and built drainage systems when there is a heavy rain in a short time of period.

1-5. Areas that require early evacuation

If you live in an area, where may have a risk of house corruptions due to flooding, a risk of a river erosion or if you live in an area, where entire house may be under water, you must take an early evacuation. Staying inside of a building in this area could cause you a life-threatening danger. Immideately evacuate to a safe place following evacuation information.

Types of designated zones		Phenomena and evacuation measures to be taken	
Areas that require early evacuation	Areas with inundation that might destroy houses The areas where houses may be washed away are marked with  in the maps on pages 13 to 30.	Flooding 	These are areas where there is a risk of "flood flow" with fast flow rate due to the bursting of banks. Early evacuation to a different location is required as there is a risk of wooden houses being destroyed.
	Areas where houses may be submerged in water	Riverbank erosion 	These are areas that are at a risk of "riverbank erosion" that may cause houses to be destroyed. Early evacuation to a different location is required as ground surface may be scraped and houses may collapse building after building.
			These are areas at a risk of flooding enough to submerge even the top floors of buildings. Early evacuation to a different location is required as staying indoors may be life-threatening.

1-6. Characteristics and warning signs of landslides

	Rock fall	Debris flow	Landslide
Different types of sediment disasters	 Stay away from slopes.	 Flee perpendicular to the channel.	 A slow-moving landslide occurs much more slowly than a regular landslide. Evacuate very early before one occurs.
Warning signs	<ul style="list-style-type: none"> ● Cracks on the cliff ● Water springing out from the cliff ● Small rocks falling from the cliff ● Sound of tree roots tearing apart or a similar sound coming from the cliff 	<ul style="list-style-type: none"> ● Rumbling sound coming from the hill or mountain ● River water suddenly turning murky or filling with driftwood ● Falling river water level despite of continuous rain ● Soil has a rotten odor 	<ul style="list-style-type: none"> ● Water bodies such as wells and swamps becoming murky ● Cracked ground ● Water gushing out from a slope ● Formation of cracks in the walls of houses, retaining walls, or in other structures ● Houses, retaining walls, trees, power poles and other structures start to lean to one side
	Examples of warning signs 		

When you notice any warning signs, immediately evacuate to a safe place and inform the city, the police station or the fire department.
 Even if "Sediment disaster warning information", which warns you the possibility of a sediment disaster has not been issued, evacuate immediately.

※Sediment disaster warning information :
 This information is announced by Yamanashi Prefecture in collaboration with the Japan Meteorological Agency (JMA) when there is high risk of sediment disasters due to a heavy rain. This information indicates a sediment disaster could easily occur. Stay alert.

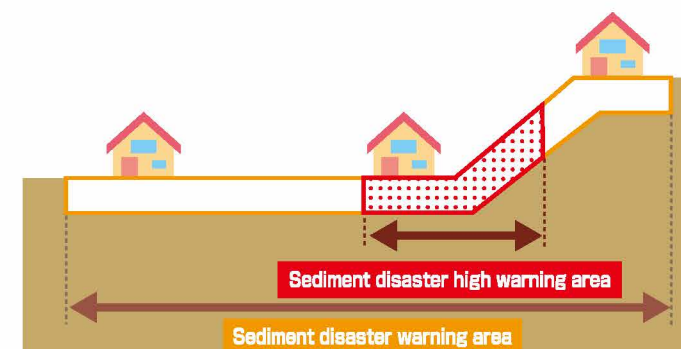
1-7. What is a sediment (high) warning area?

Yamanashi Prefectural Government has designated some areas as sediment disaster prone areas. The areas are classified into two types according to the risk level: "Sediment disaster high warning areas" and "Sediment disaster warning areas"

Sediment disaster (high) warning area

Sediment disaster warning area
 The warning and evacuation system shall be established for the sediment disaster prone areas. The warning and evacuation system includes public dissemination of danger and creating a warning and evacuation manual.
 ※ Regulations will be issued for some development projects.

Sediment disaster high warning area
 A licensing system for specific development projects, structural control for building as well as building relocation advisories and supporting measurements shall be introduced to the sediment disaster prone area, which may cause massive damage to the residents due to building corruption.



※In the event of a mudslide

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