

About flood

Types of flood

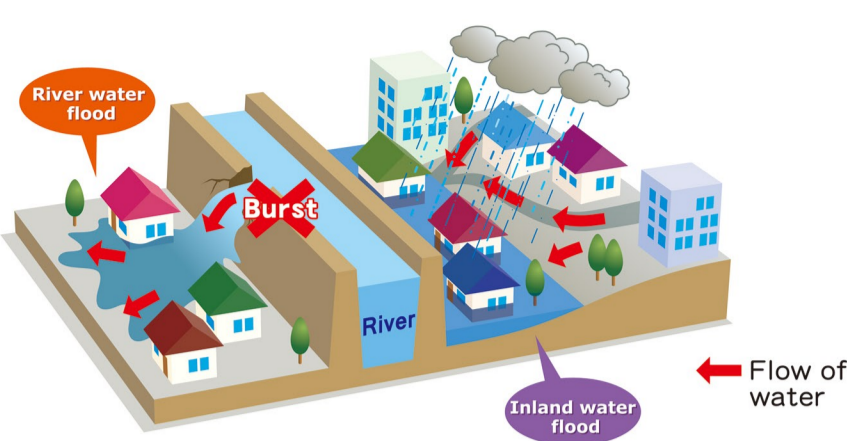
There are two major types of flood: "river water flood" and "inland water flood."

Inland water flood

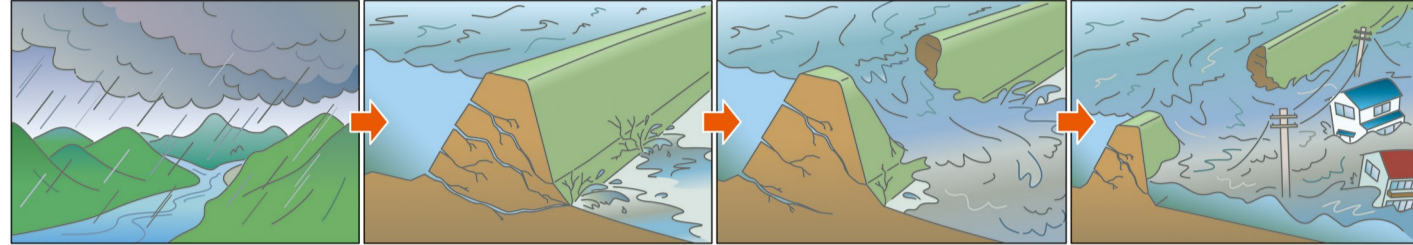
- Rainwater accumulates at the spot.
- There is a rainfall that exceeds sewerage drainage capacity.
- Water level of a river is too high to drain into.

River water flood

- A river overflows the levee.
- The levee bursts.

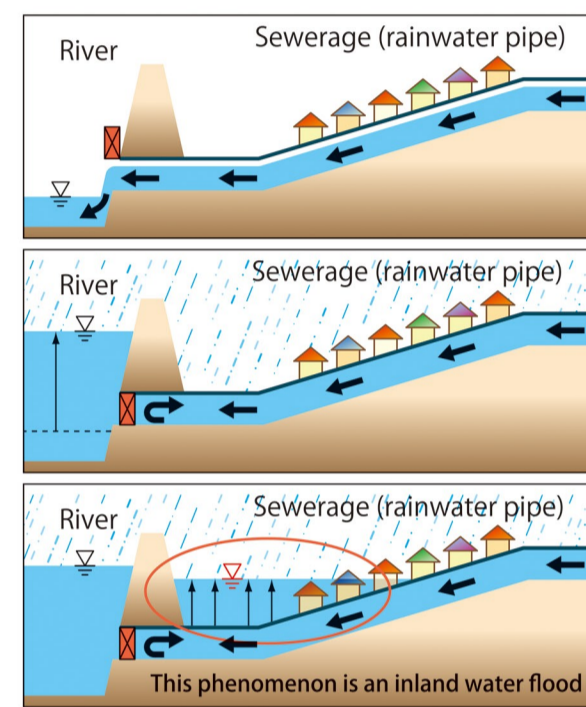


Mechanism of river water flood



Heavy rain increases the volume of water in the river, and the water level starts to rise. Once the water reaches the top of the levee, the levee starts to be pressurized by the water. As the water increases, the levee cannot withstand water pressure, part of which begins to burst accordingly. As the burst spreads at once, water rushes out and attacks houses and others.

Mechanism of inland water flood



In normal times
As the water level of the river to drain into is low, rainwater is drained through the sewerage (rainwater pipe).

When a river level rises
When water level of the river rises due to high tide or heavy rains, it may exceed that of sewerage (rainwater pipe) and result in backflow phenomena. Accordingly, the floodgates are to be closed to prevent the backflow.

At the time of inland water flood
If the water level of the river does not fall, the running water of the sewer (rainwater pipe) overflows, causing flooding damage near the confluence, which is called inland water flood.

Weather Information

Weather warnings and advisories issued by Japan Meteorological Agency

The Japan Meteorological Agency issues weather advisories and warnings, etc. when a disaster might occur due to meteorological phenomena such as heavy rains or strong winds to alert residents. With awareness to protect their own lives by themselves, residents are requested to pay careful attention to weather information and so forth, and voluntarily evacuate at their own discretion even before an evacuation advisory or the like is issued.

Criteria	Content of Warnings, etc.	Actions that residents should take
Heavy Rain Advisory	When a disaster is likely to be caused by heavy rain.	• Pay attention to the latest information and start preparation for a disaster early. • Early action is recommended for those living in areas prone to flooding or those who are deemed slow to evacuate.
Flood Advisory	When a disaster is likely to be caused by river rise, flood, or levee burst.	
Heavy Rain Warning	When a serious disaster is likely to be caused by heavy rain. Heavy Rain Warning (inundation) or Heavy Rain Warning (sediment disaster) will be issued.	• People living in areas where evacuation is recommended including Meguro River Flood/Inundation-Assumed Area and adjacent disaster prevention areas are requested to prepare for evacuation, such as people who are the elderly and the disabled who are deemed slow to evacuate. • Those who live in other areas are requested to pay attention to information on evacuation issued by Meguro City, and start preparing for evacuation.
Flood Warning	When a serious disaster is likely to be caused by river rise, flood or levee burst. "Flood Warning for Meguro River" is issued.	• People living in areas where evacuation is recommended including Meguro River Flood/Inundation-Assumed Areas and sediment disaster Warning Areas are requested to evacuate or evacuate vertically to the second floor or higher of a sturdy building. • Those who are in other areas are asked to pay attention to information on evacuation issued by Meguro City, and start evacuation as needed.
Record Downpour Information	When a downpour with a scale seen only once in every few years has been observed and is expected to cause sediment disaster or flood to the area.	
Sediment Disaster Alert Information	When Heavy Rain Warning (Landslide Disaster) has been issued and a life-threatening sediment disaster is likely to happen at any moment.	
Heavy Rain Special Warning	"Special warnings" will be issued if a serious disaster is imminent, calling for utmost precaution against it. We are under an extraordinary situation as an exceptional risk of a magnitude observed only once every few decades is pressing.	• Take an action to protect your own life immediately.

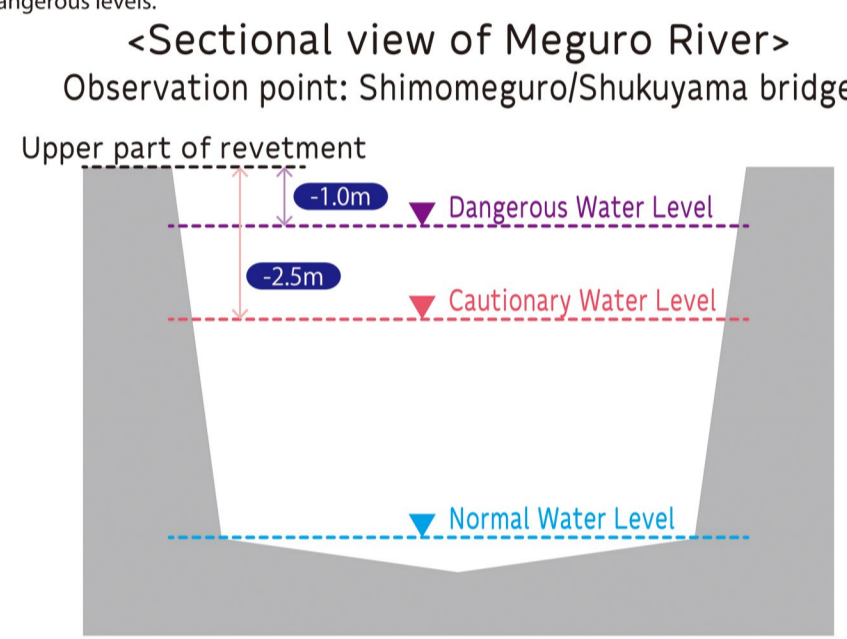
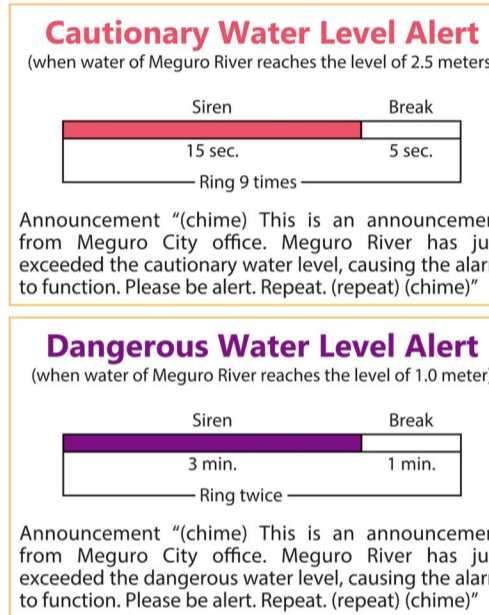
Intensity and patterns of rainfall

Rainfall patterns show us the approximate amount of rainfall. Grasp the relationship between rainfall patterns and the amount of rainfall so as to proactively decide to evacuate before the situation becomes dangerous.



Water level and warnings

The Meguro River water level is monitored by both water gauges and water level alarm devices. A siren is blown and announcement is made if water reaches dangerous levels.



Evacuation actions/evacuation information

About evacuation actions

The following actions taken to protect one's own life are defined as evacuation actions. Depending on the rainfall status, or during night-time, it may be dangerous to go out. Take evacuation actions in accordance with the situation.

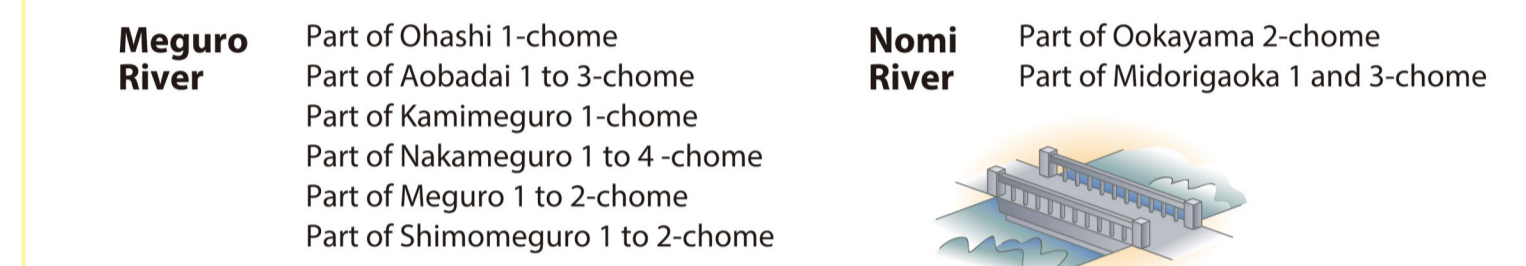
- "Evacuation for refuge" to the nearest evacuation site
- "Evacuation for refuge" to neighboring safer places and buildings.
- "Ensuring safety indoors" (moving to a safer room in the building where you stay at that time)

About evacuation information

There are three levels of evacuation information. Information will be announced via disaster prevention wireless broadcasts, disaster prevention weather information email, television, radio, and website. Areas where evacuation is recommended and the issuance criteria for evacuation advisory when the Meguro River or the Nomi River floods are listed as follows. Act calmly if evacuation information is issued.

Types of evacuation advisory/Conditions at the time of issuance	Issuance criteria (Meguro River)	Issuance criteria (Nomi River)	Actions that residents should take
1. Evacuation preparation/Start evacuation of the elderly	Residents are asked to prepare for evacuation, pay attention to weather information/water level information, and start voluntary evacuation actions.	• When the water level at Aobadai Observatory has reached the "Cautionary Water Level" and there is possibility of continuous rise in the water level for the future	• Those who are in the areas where evacuation is recommended are asked to start preparation for evacuation for refuge to the nearest evacuation site, or vertical evacuation (ensuring safety indoors) to the second floor of a sturdy building or above. • Those who need time to evacuate, such as the elderly or the disabled, are asked to start evacuation.
2. Evacuation advisory	Residents are asked to start the planned evacuation actions at this stage where the possibility of the occurrence of human damages has clearly increased.	• When the water level at Aobadai Observatory has reached the "Dangerous Water Level of Flooding," and flood risk information is issued	• People living in areas where evacuation is recommended are requested to evacuate or evacuate vertically, while securing indoor safety, to the second floor or higher of a sturdy building.
3. Evacuation order (emergency)	At this stage, it is determined that the possibility of the occurrence of human damages is extremely high. Damages may actually occur. Residents are asked to complete the planned evacuation actions immediately.	• When the water level at Aobadai Observatory has reached the "Flood Occurrence Water Level" • When there is a risk of bursting of the levee due to abnormal water leakage progression, cracks, landslides, and so forth • When burst or overflow occurs	• Those who are in the areas where evacuation is recommended are asked to complete evacuation for refuge to the nearest evacuation site, or vertical evacuation (ensuring safety indoors) to the second floor of a sturdy building or above.

Areas where evacuation is recommended



* "Inland water flood" is counted out as the criteria of evacuation advisory because of flooding from the sewerage. However, when judging that there is a life-threatening risk depending on scale of rainfall, evacuation advisory and other orders will be issued after examining the following items comprehensively:
A) When "flood forecast (flooding warning information)" has been issued by the Tokyo Metropolitan Government and the Japan Meteorological Agency.
B) Heavy rain warning (sediment disaster or flood damage) has been issued by the Japan Meteorological Agency.
C) When sediment disaster warning information has been issued by the Japan Meteorological Agency.
D) When the upstream area of river has been damaged by a flood and the downstream area is in danger.
E) When a significant risk is imminent due to a landslide, etc.
F) When other significant risks related to flood damage are imminent.

Information collection

About Information collection

Information issued by the national government or the Tokyo Metropolitan government including weather information, "preparation for evacuation preparation/starting evacuation by the elderly and etc.," "evacuation advisory," and "evacuation order (emergency)" will be delivered to residents via following ways. Make sure how to get the information.

About storm surge

Mechanism of storm surge occurrence

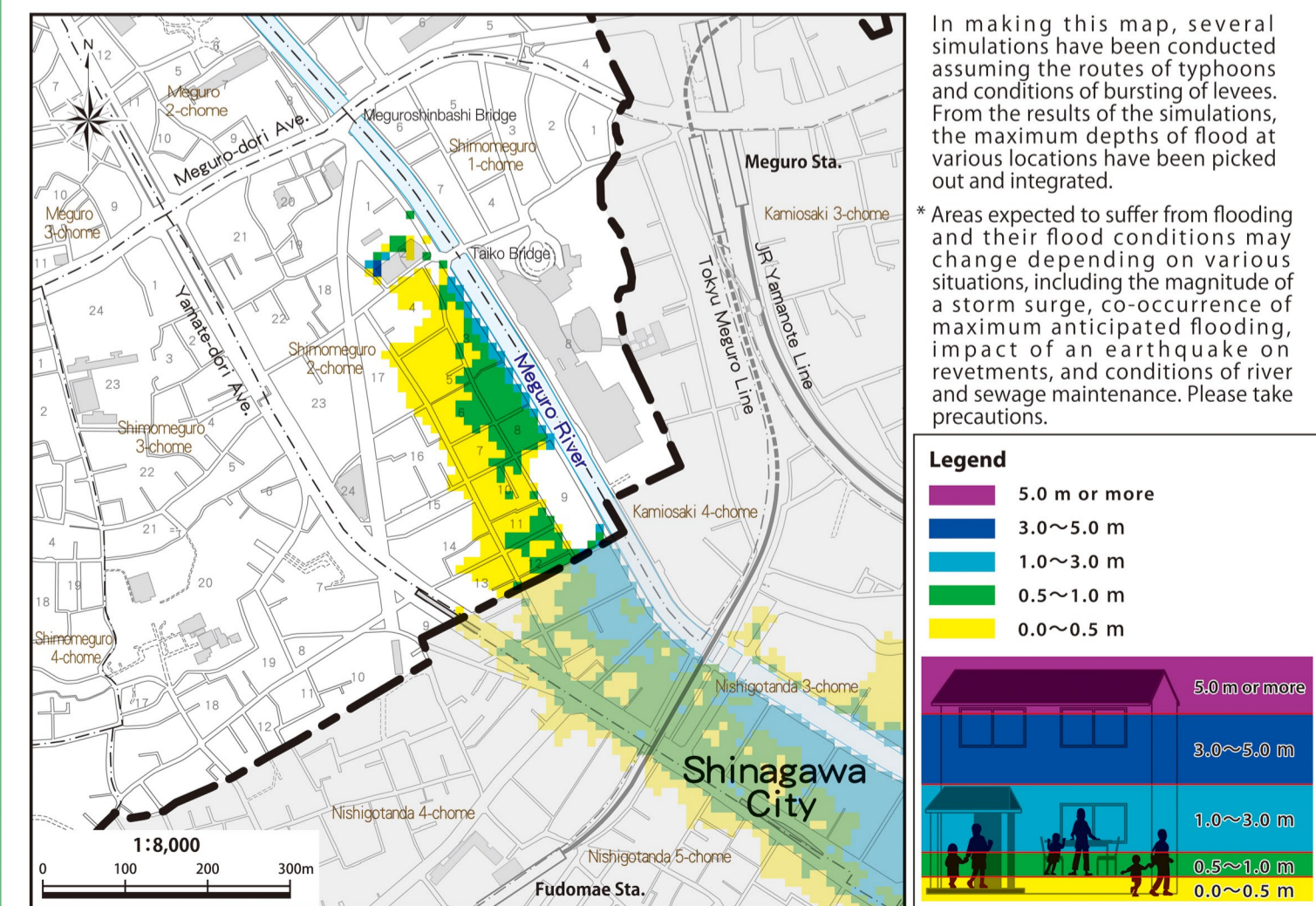
Two main causes of a storm surge occurrence are as follows:

- 1. Sea surface sucked up due to a drop in atmospheric pressure**
Because the central atmospheric pressure of a typhoon or a low pressure system is lower than that of the surroundings, the surrounding air puts pressure on the sea surface, and the air near the center sucks it up, resulting in the rise of the sea surface. When atmospheric pressure drops by 1 hectopascal (hPa), the sea surface rises by 1 centimeter.
- 2. Blown by wind**
When a strong wind associated with a typhoon blows from the offshore towards the coast, seawater is blown to the coast and the sea level near the coast rises abnormally. The shallower the water depth, the stronger the blowing wind, making it easier to develop a storm surge.



Map of storm surge flood risk area (depth of flood)

This map shows the areas where flood is expected to take place and how deep the flood is expected to be when maximum anticipated storm surge on the coast of Tokyo Bay as stipulated in the provisions of the Flood Control Act causes flood generated from the Meguro River.

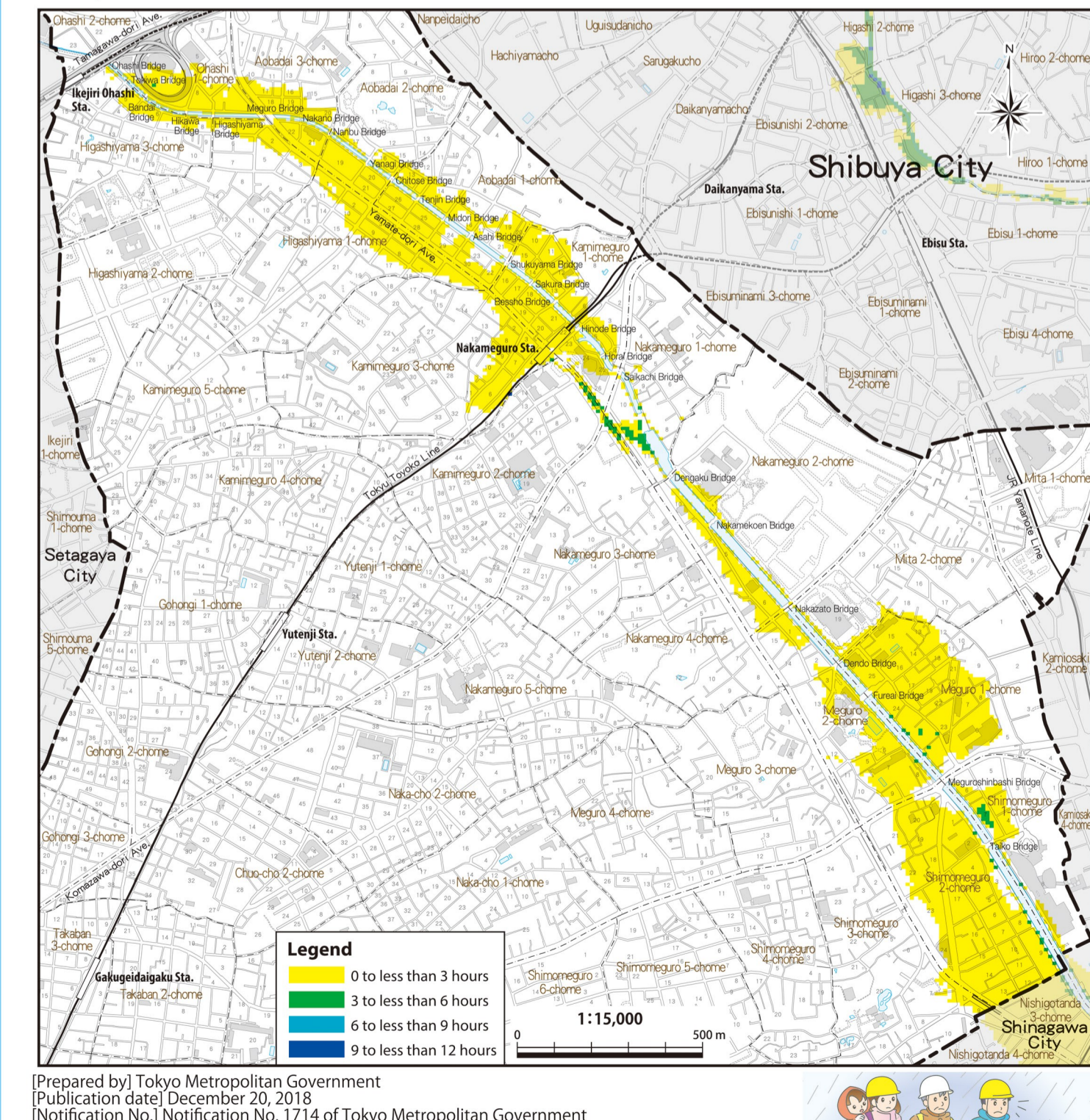


[Prepared by] Tokyo Metropolitan Government (Bureau of Ports and Harbors, Bureau of Construction)
[Date of Preparation] March 30, 2018
[Storm surge, which is a premise for creating the map] a storm surge caused by a typhoon with central atmospheric pressure upon landing of 910 hPa, maximum cyclostrophic wind radius 75 km, and travel speed of 73 km/h

Duration time of flood inundation

About a map of duration time of flood

- (1) This map shows the duration time of flood in the flood forecast section of Meguro River in the Meguro River water system, flood of which is caused by the maximum anticipated precipitation as stipulated the provisions of the Flood Control Act.
- (2) This duration time of flood is calculated based on flood status estimated by simulation in the case that the Meguro River in the Meguro River water system has overflowed due to flooding accompanied by the maximum anticipated precipitation, considering improvement situation of river channel and flood control facilities of the Meguro River in the Meguro River water system at the time of official announcement. It indicates the time to continue its flood depth of 50 cm or more. The map shows that flood in most areas of Meguro City is expected to recede within 3 hours.
- (3) In this simulation, flooding of tributaries, flooding caused by rainfall exceeding the premise of this simulation, flooding due to storm surge or inland water flood, and so forth are not considered. Therefore, this simulated duration time of flood may be different from the actual duration time of flood, or flood may occur in areas where the duration time of flood is not specified.



[Prepared by] Tokyo Metropolitan Government
[Publication date] December 20, 2018
[Notification No.] Notification No. 1714 of Tokyo Metropolitan Government (Act No. 193 of 1949)
[Target flood forecasting rivers] Shibuya River and Furukawa River in the Furukawa River water system
[Rainfall, which is a premise for calculation] Maximum rainfall per hour is 153 mm in the basin of the Shibuya River/Furukawa River, and the basin of the Meguro River
Total amount of rainfall for 24 hours is 690 mm

Sediment disaster

Types of sediment disaster

There are three types of sediment disaster: collapse of steep slopes (slope failure), debris flow, and landslides. Most sediment disasters are caused by typhoon, heavy rain, continuous rain, and earthquakes. In the case of heavy rain or continuous rain, a large amount of water soaks into the ground, and the increased water weakens the resistance of the soil on the slope (the ground loosens), resulting in an increase of the risk of disasters. The sediment disaster that may occur in Meguro City is collapse of steep slopes (slope failure).

Collapse of steep slopes (slope failure)

In this phenomenon, a slope abruptly collapses when the soil that has been weakened by moisture in the ground loses its self-retainability under the influence of a rain or an earthquake.



About Act on Sediment Disaster Prevention

"Act on Sediment Disaster Countermeasures for Sediment Disaster Prone Area (Act on Sediment Disaster Prevention)" is intended to promote non-structural measures to protect people's lives from sediment disasters, including the dissemination of information on areas potentially endangered by sediment disasters, improvement of alert and evacuation systems, and restriction of new housing and land development.

Sediment disaster warning area and sediment disaster special warning area

Sediment disaster warning area (Yellow zone)
Areas where residents are likely to suffer from injuries or fatalities in the event of sediment disasters such as collapse of steep slopes.

Sediment disaster special warning area (Red zone)
Areas where damage to buildings is anticipated, causing serious injuries or fatalities to residents in the event of sediment disasters such as collapse of steep slopes.

Designation criteria

- Area with slope having an inclination of 30 degrees or more and a height of 5 m or more
- Area with less than 10 m of horizontal distance from the top end of its steep slope
- Area within a distance twice the height of steep slope 150 m if it exceeds 50 m from the bottom end of the slope

Designation criteria

- Area where damage to buildings is anticipated, causing serious injuries or fatalities to residents in the event of sediment disasters such as collapse of steep slopes

Subsidy program in sediment disaster special warning area
Subsidy program of expense for repairing or moving unqualified existing buildings in the area is available.

Contact information
Anti-earthquake Promotion Subsection, Building Section, Urban Planning & Development Department, Meguro City
Phone 03-5722-9490

In addition to this map, you can check sediment disaster warning areas on the website of the Bureau of Construction, Tokyo Metropolitan Government as well. (http://www.kensetsu.metro.tokyo.lg.jp/river/rdosha_saigai/kasenbu0015.html). Furthermore, more detailed maps are available at the following facilities.

- Planning Section, River Division, Bureau of Construction, Tokyo Metropolitan Government (Tokyo Metropolitan Government Main Building No. 2)
 - Building Section, Urban Planning & Development Department, Meguro City (6F in Meguro City Office Complex)
 - Disaster Prevention Section, Security Management Office, Meguro City (in Meguro Disaster Prevention Center)
- The following regulations are further applied to Special warning areas.**
- **Permission system for specific development action**
Land development for land sales in lots and for construction of facilities for those who need special care is authorized only when the construction is carried out in compliance with the standard.
 - **Restriction on building structures**
A building verification system and structure regulations apply to a building having habitable rooms for judging whether the building has a safe building structure against estimated impact.
 - **Recommendations including relocation of buildings**
Recommendation for relocation to a safe area may be given to an owner of a building that has risk of significant harm to residents because of damage from a sediment disaster.
 - **Measures taken in transaction of building lots and buildings**
It is obligatory for a real estate agent to give clients adequate explanation on key issues on the licensing requirement for specific development before the sale of the land or building concerned.

Regular preparation

Regular preparation and important things to know for evacuating

- **Evacuate safely**
Make sure you know the location of the evacuation site near your house, and the evacuation route through which you can pass safely. It is advisable to make marks on the map after confirmation. Help each other, and evacuate quickly to a safe place along a safe route.
- **Please give a helping hand to people who need consideration when you evacuate**
Elderly people, people with disabilities, and people who are ill or injured need to evacuate early. Please help evacuate those around you who need consideration.
- **Comfortable clothes, evacuation with a group of two or more people**
When you evacuate, wear clothes that allow easy movement, and evacuate calling out to each other with your neighbors. In addition, when you are walking, check the safety of your path using a cane or the like, because it is difficult to recognize boundaries of roads/ditches covered with water.
- **Stay away from dangerous places**
Regularly check the locations of dangerous places or safe places around your home or at the places you frequently pass through. When going out, stay away from steep slopes.

Items to be taken in case of emergency/Stockpile

Prepare necessary items so that you can evacuate quickly. Check the best-before date of emergency food as well.

- Items to be taken in case of emergency**
- Prepare in advance items to be taken in case of emergency.
 - Narrow down the items to the minimum necessary so as to lessen a burden (Male: 15 kg, Female: 10 kg as a guide)
- Valuables**
- Cash (including small change)
 - Passbooks
 - Certificates
 - Identification
 - Health insurance card
 - Drivers license
 - Seal
- Pocket radio**
- Spare batteries (prepare more than usual)
- Flashlights**
- Spare batteries
 - Spare bulbs (have a flashlight ready for each person)
- First-aid medicine**
- Adhesive plasters
 - Gauze
 - Bandage
 - Antiseptic solution
 - Antipyretic
 - Digestive medicine
 - Cold medicine
 - Painkiller
 - Household medicine
 - A pair of tweezers
- Emergency food and drinking water**
- Hardtack and canned food
 - Drinking water
 - Water bottles
 - Water plates
 - Cups
 - Can openers
- Others**
- Underwear
 - Outer garment
 - Socks
 - Towels
 - Rain gear
 - Cotton gloves
 - Tissue paper
 - Plastic bag
 - Knife
 - Spare glasses
 - Surgical masks
 - Whistles
 - Soap
 - Sanitary items
 - (If you have an infant: Milk, Baby bottles, Diapers)
 - (If you have family members who require nursing care: Extra clothes, Diapers, Disability certificate, Household medicine)
- Emergency stockpile**
- Items necessary to live for several days until disaster recovery
 - Stock and check the items on a daily basis.
- Food**
- Canned food and retort-pouch food
 - Dietary supplements (including chocolates, pickled plums, and cheese)
- Water**
- Drinking water (3 liters a day per person as a guide)
 - Water for daily life: Keep water in a kettle or a pot, and leave water in a bathtub (Used for cooking, laundry, flushing the toilet, etc.)
- Fuel**
- Tabletop stove
 - Spare portable gas cylinders
 - Solid fuel
- Others**
- Blankets, sleeping bags
 - Toiletries
 - Emergency toilet
 - Toilet paper
 - Buckets
 - Plastic containers
 - Disposable pocket warmers
 - Candles
 - Tootle
 - Blue taps
 - Kitchen wraps
 - Newspaper
 - Pet food (if you have pets)

Disaster prevention memo of my family

Prepare in advance the emergency contact information of your family members and how your family members will contact each other at the time of emergency. Make confirm the place to meet when your family become scattered.

Evacuation site of my family members

Meeting place of my family

Emergency contact information of family members