

# Fukui City Inland Water Hazard Map

2022 Special Edition

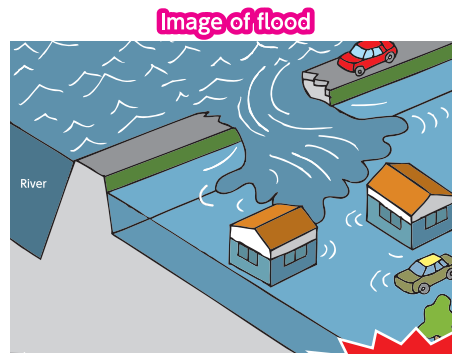
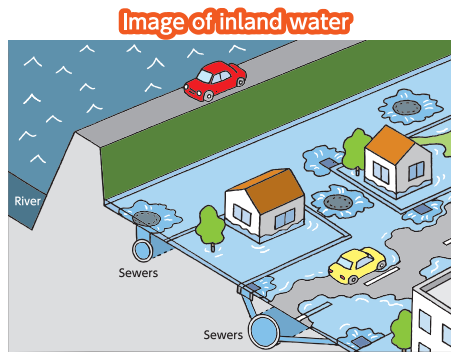


You can also check on the Fukui City website.



## 3. Differences between inland water and floods (use various maps appropriately)

"Inland water" is inundation that happens when rainwater cannot drain from sewers of an urban area into rivers. A "flood" is inundation that happens when the water level of a river rises so high and overflows its embankments. "Inland water" happens more frequently than floods, and causes inundation damage in a short time during heavy rain. "Floods" happen less frequently than inland water, but can cause major flood damage.



In the case of inland water, damage happens relatively suddenly. Therefore, it is important to prepare in advance.

Fukui City Flood and Landslide Hazard Map

You can check the Fukui City Flood and Landslide Hazard Map on the Fukui City website.  
<https://www.city.fukui.lg.jp/kurasi/koutu/kasen/p010331.html>



Damage Scenario

Rain starts

Due to heavy rain, the sewer system cannot drain and rainwater accumulates in urban areas.

Flood!

How to use the Flood and Landslide Hazard Map

Flood and landslide!

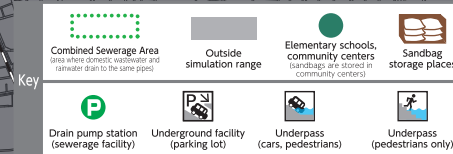
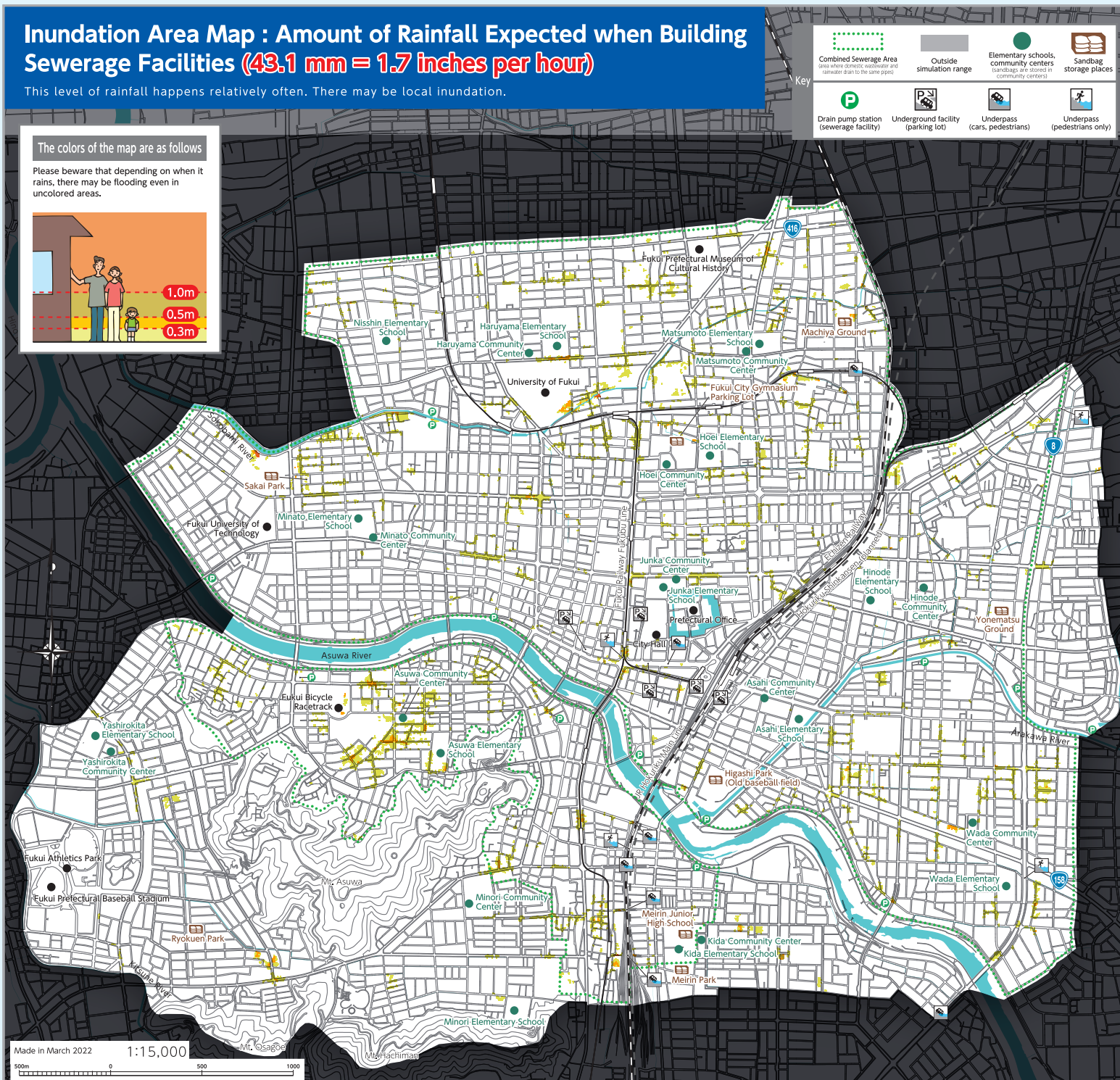
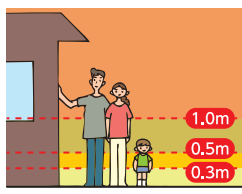
Heavy rain continues for a long time, so water levels of rivers rise, eventually overflowing their embankments or causing the embankments to collapse.

## Inundation Area Map : Amount of Rainfall Expected when Building Sewerage Facilities (43.1 mm = 1.7 inches per hour)

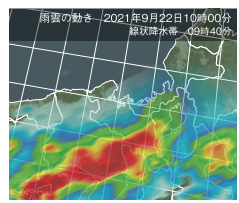
This level of rainfall happens relatively often. There may be local inundation.

The colors of the map are as follows

Please beware that depending on when it rains, there may be flooding even in uncolored areas.



## Pay attention to weather information and disaster prevention information



The "Fukui City Inland Water Hazard Map" is used to identify in advance places where rain tends to accumulate, in order to prepare for heavy rains. To use this hazard map properly, it is important that you check accurate weather information and disaster prevention information. If there is a risk of flooding or landslides, please check the "Fukui City Flood and Landslide Hazard Map", and use each map accordingly to the weather and disaster prevention information.

## 1. How to Get Information

Here are some of the ways that information is communicated to citizens.

**Information delivered to citizens**

Emergency Broadcast System (loudspeakers)

PR vehicles, etc.

Early Warning Email (Area email)

**Citizens**

Emergency Broadcast System

To check broadcast content, call 0776-25-2914

Fukui City Disaster Prevention Weather Information Emails

Delivers information about evacuation and weather, as well as notices from Fukui City.

LINE

Delivers warning levels, evacuation information, etc.

@fukuicity

Delivers information about evacuation, weather, and

Yahoo! Disaster Prevention Prompt Report (app)

**Information citizens must gather**

TV (d Button), Radio

City disaster prevention info

National/Prefectural disaster prevention info

**Citizens**

Fukui City Website

Here you can check disaster information regarding evacuation, etc.

<http://www.city.fukui.lg.jp/>

Facebook

@Fukui.city.Bousai.Info

Twitter

@FukuiCity\_Bosai

Japan Meteorological Agency (JMA) Website

Here you can check information about meteorological phenomena, including rain and other weather, from JMA.

## 2. Disaster prevention information and code of conduct

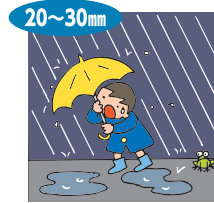
Please act by making effective use of disaster prevention weather information, such as warnings and alerts, issued by the Japan Meteorological Agency. Please pay attention to evacuation information issued by Fukui City and use the Fukui City Flood and Landslide Hazard Map when evacuating.

Alert Level	Evacuation Information	Disaster Prevention Weather Information	Expected disasters
5	Emergency Safety Measures	Heavy rain special warning	Flood
4	Evacuation Instruction	Landslide alert information	Landslide
3	Evacuation of the Elderly, etc.	Flood warning, Heavy rain warning	Inland water

Level 1 = Early Advisory, Level 2 = Advisory

- Heavy Rain Emergency Warning** : This announcements is made when heavy rain is expected to far exceed the standard for making a normal heavy rain warning, and there is significantly high risk of a severe disaster. Immediately take proper actions to evacuate.
- Landslide Warning Information** : This information is announced when the risk of landslide becomes higher after the announcement of a heavy rain warning (landslide) is issued. Special attention must be given to people who live in or near landslide special caution zones. (See the Fukui City Flood and Landslide Hazard Map)

## 4. Intensity and Pattern of Rainfall



- "Heavy rain"
  - Get wet even holding an umbrella.
  - It is hard to hear people speaking.
  - Even with car windshield wipers on high speed, it is difficult to see forward and drive.



- "Violent Rain"
  - Roads flood like rivers.
  - The sound of rain may be noticeable even when sleeping.
  - It is dangerous because the brakes may not work when driving vehicles.



- "Extremely Violent Rain"
  - Umbrellas become totally useless.
  - Water pounds with a roaring sound like a waterfall.
  - It is dangerous to drive vehicles.

## 5. Advance Preparations

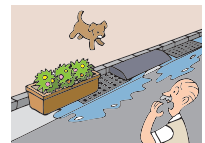
### To reduce damage

Please cooperate by cleaning the areas around drainage facilities



If street inlets or gutters around your house are blocked with fallen leaves or dirt, it will be difficult for the rainwater to drain into them, so please cooperate with regular cleaning.

Do not put objects on street inlets or gutters



If there are objects on street inlets or gutters, rainwater will not drain, and roads may be flooded.

Store valuables in high places



Move valuables to the second floor or other safe place, in case your house floods.

Check the locations of sandbags



You can take sandbags home from the community centers and other places where sandbags are stored, which are shown on the map. Be prepared for flood damage before disasters happen. Some sandbags are filled with water. Community centers on the map have the swelling type. (Please go to community centers when they are open.)

Do drills in advance, such as stacking sandbags



Do drills in advance, such as stacking sandbags, in order to prevent rainwater from inundating your home.

Participate in disaster prevention drills



Various disaster prevention drills are held in Fukui City. Participating in drills is a good opportunity to raise your awareness of disaster prevention and learn how to deal with disasters. Please participate with your family, your neighbors, people at your workplace, etc.

Install a rainwater tank in your house



By installing a rainwater tank and storing rainwater without letting it flow into the sewer, it is possible to reduce burden on the sewers when there is heavy rain. Also, stored rainwater can later be used effectively in clear weather.

Install waterstops in your house



Installing waterstops can prevent rainwater from getting in to your house.

Fukui City partially subsidizes the cost of installing rainwater tanks and waterstops, in order to reduce flood damage in the central area of the city. (Limited to the target area)

● Link to details  
<https://www.city.fukui.lg.jp/kurasi/gesuipproject/2017usui.html>



### For evacuation guide

Check your evacuation route in advance



Check in advance to find areas where inundation may be deep and the location of underpasses that may become impassable.

Prepare emergency goods



Collect emergency goods and keep them close to you so that you can evacuate at any time.

Prepare comfortable clothes



Prepare clothes that are easy to move in for evacuation. Prepare something you can use as a walking stick, such as a long pole, so that you can check your footing when evacuating.

It is also important to check the location of evacuation shelters near you on the "Fukui City Flood and Landslide Hazard Map" in preparation for a risk of flooding.

### For inquiries regarding the inland water hazard map

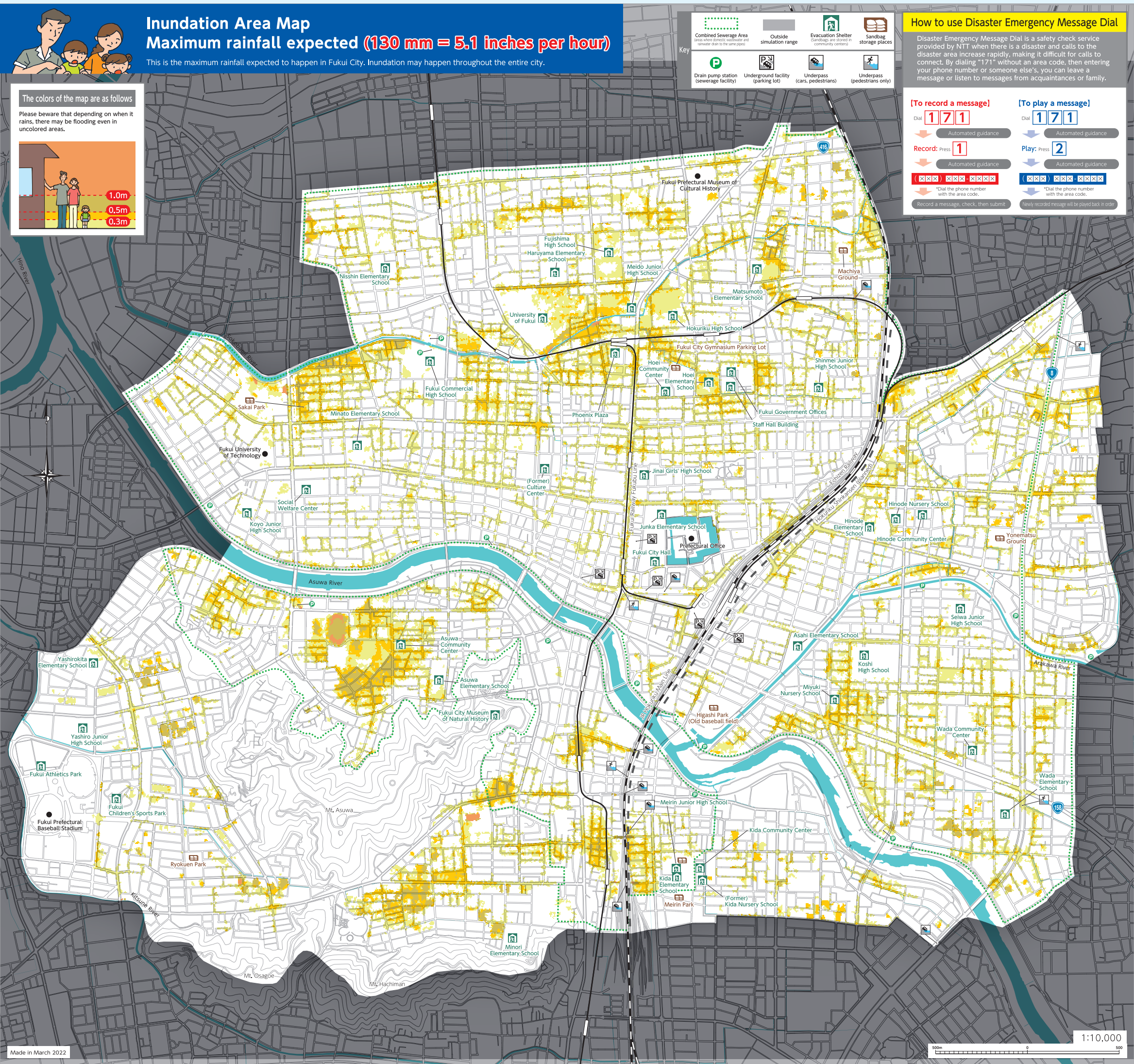
Flood Control Section, Sewage Pipe Line Division, Waterworks as Sewage Operation Department, Waterworks and Sewage Bureau, Fukui City TEL 0776-20-5651

### Please contact the city government for other problems as well

About the Fukui City Flood and Landslide Hazard Map  
 River Division, Construction Department, Fukui City TEL 0776-20-5492

About evacuation  
 Crisis Management Division, Crisis Management Bureau, Citizen's Life Department, Fukui City TEL 0776-20-5234





# Inundation Area Map

## Maximum rainfall expected (130 mm = 5.1 inches per hour)

This is the maximum rainfall expected to happen in Fukui City. Inundation may happen throughout the entire city.

The colors of the map are as follows

Please beware that depending on when it rains, there may be flooding even in uncolored areas.

1.0m  
0.5m  
0.3m

### How to use Disaster Emergency Message Dial

Disaster Emergency Message Dial is a safety check service provided by NTT when there is a disaster and calls to the disaster area increase rapidly, making it difficult for calls to connect. By dialing "171" without an area code, then entering your phone number or someone else's, you can leave a message or listen to messages from acquaintances or family.

**[To record a message]**

Dial **171**

Automated guidance

Record: Press **1**

Automated guidance

**(XXX) XXX-XXXX**

\*Dial the phone number with the area code.

Record a message, check, then submit

**[To play a message]**

Dial **171**

Automated guidance

Play: Press **2**

Automated guidance

**(XXX) XXX-XXXX**

\*Dial the phone number with the area code.

Newly recorded message will be played back in order

## 6. What to do when there is risk of inundation

### Install sandbags and waterstops

You can reduce inundation damage by installing sandbags and waterstops at entrances and exits to your house and basement.

### Prepare for backflow of air from toilets and drains ①

Due to heavy rain, air may backflow from the sewer. You can suppress the backflow of air by blocking your toilets and drains with double or triple layered plastic bags filled with water.

### Prepare for backflow of air from toilets and drains ②

By replacing the lid of the dry well in your house with an open type, it is possible to remove air from the sewer that has backflowed. This is effective for preventing air from bubbling up from the toilet.

**● If you do not have sandbags or waterstops at home, you can use households items to reduce intrusion of water.**

#### Simple measures you can take at home

Here we show how to use household items to reduce intrusion of water in early stages when water is shallow.

##### Simple water bags made from garbage bags

Double layer 40 liter bags, then fill them about half way with water. Put the bags in cardboard to increase their strength.

##### Using plastic tanks and plastic tarps

Make a barrier by wrapping plastic tarps around plastic tanks filled with water to keep them together.

##### Using planters and plastic tarps

Make a barrier by wrapping planters with a canvas filled with soil.

##### Using boards, etc.

Make barriers at doorways using long boards, etc.

#### If you are in a basement or underground parking lot, evacuate above ground

Rainwater easily flows into basements and underground parking lots, so please evacuate above ground as soon as possible.

#### Refrain from draining water from your house as much as possible

When there is heavy rain, draining bath water or laundry water will increase damage caused by inundation. Please refrain from draining water.

## 7. Precautions about evacuation

### Inland water inundation due to local heavy rain often occurs suddenly, so it is assumed that no evacuation shelters have been opened yet. If no evacuation shelter has been opened...

#### Evacuate to a high place

If there is a sudden backflow, it is effective to evacuate to a high place, as an emergency measure.

#### Take measures to protect yourself and wait at home

Inundation damage caused by inland water tends to recede after relatively short time, so one method is to not hurry, and simply wait on the second floor of your house or another safe place until the water has receded.

#### Evacuate before inundation happens

If inundation depth is higher than knee height, it will be difficult and extremely dangerous to walk through floodwater. When evacuating, you may trip into ditches or manholes that have lost their covers. Use something as a walking stick, such as a long pole, to check your footing.

### Evacuation Tips: Evacuating by means of mutual aid

- Evacuate with two or more people**  
It is difficult to do safety checks when evacuating alone, so please move in groups of at least two people.
- Talk to your neighbors**  
When evacuating, talk to your neighbors, and act with a sense of "mutual assistance" among neighbors.
- Offer evacuation support for senior citizens and people with disabilities**  
Please support people who need time to evacuate, such as senior citizens, people with disabilities, and infants, by providing information promptly to encourage early evacuation.

\*See the "Fukui City Flood and Landslide Hazard Map" for how to evacuate in the event of rivers flooding.

## 8. Mechanisms of heavy rain

In recent years, there have been many disasters nationwide caused by "local heavy rain" and "concentrated torrential rain". These disasters occur suddenly with the development of cumulonimbus clouds (thunderclouds) and can cause great damage in a short time. Make sure to understand the "mechanism of heavy rain" in advance, and pay attention to "weather information," so you can take appropriate action quickly to minimize damage.

### ① Creation and development of cumulonimbus clouds

Clouds are created when air is pushed up into the sky by updrafts. As updrafts intensify and clouds continue to grow, they become cumulonimbus clouds which bring rain. Each individual cumulonimbus cloud has a short lifespan and does not spread far, so it often starts raining suddenly and stops raining after a short time, commonly known as a "rain shower."

### ② Local heavy rain and concentrated torrential rain

When the atmosphere is unstable, cumulonimbus clouds continue to develop, causing heavy rainfall over a short time and narrow range, becoming local heavy rain. Local heavy rain is caused by the development of a single cumulonimbus cloud. Rain intensifies temporarily, resulting in total rainfall of a few tens of millimeters (a few inches) locally. Concentrated torrential rain is caused by repeated creation and development of cumulonimbus clouds in the same place due to weather conditions such as fronts and low pressure systems. Violent rain continues for a long time, with total rainfall of several hundred millimeters (a few feet) in a small area. Local heavy rain and concentrated torrential rain temporarily make it difficult to drain rainwater, which may cause inland inundation.

### Mechanism of sudden heavy rain (image)

Moved by wind in the sky

Cumulonimbus clouds are suddenly created and developed

Clouds can be created one after another

Heavy rain falls locally

Warm and moist air

Violent updrafts

Made in March 2022

Scale: 1:10,000