

In recent years, due to climate change on a global scale, storm and flood damage caused by violent typhoons and heavy rains has occurred frequently. Understand storm and flood damage correctly, and let's think about countermeasures.

## Assumption of Flooding in Matsubushi Town

The Matsubushi Town Flood Hazard Map is a map designed to minimize damage to the townspeople. Knowing information about floods and inundation and how to evacuate will raise awareness of disaster prevention on a daily basis, leading to safe and smooth evacuation actions in case of emergency.

Various information necessary for safe evacuation from areas where flooding is expected, such as inundation information that predicts the extent and depth of flooding in the event of river flooding, evacuation sites during flooding, and knowledge and understanding of flood damage, are displayed in an easy-to-understand manner.



### Target river

Flooding assumptions in Matsubushi Town cover the Tone River, Edogawa River, Nakagawa River, Arakawa River, Ootoshifurutone River, Moto-Arakawa River, and Niigata River, for which the national or prefectural governments have announced areas that may be flooded.

Although it varies depending on the size of the river and the state of maintenance, it is assumed that the damage will be caused by flooding, such as when the embankment breaks due to heavy rain or the water overflows.

#### Tone River, Edogawa River

72-hour total rainfall of 491 mm in the Tone River basin and upstream of Yattajima

#### Nakagawa River

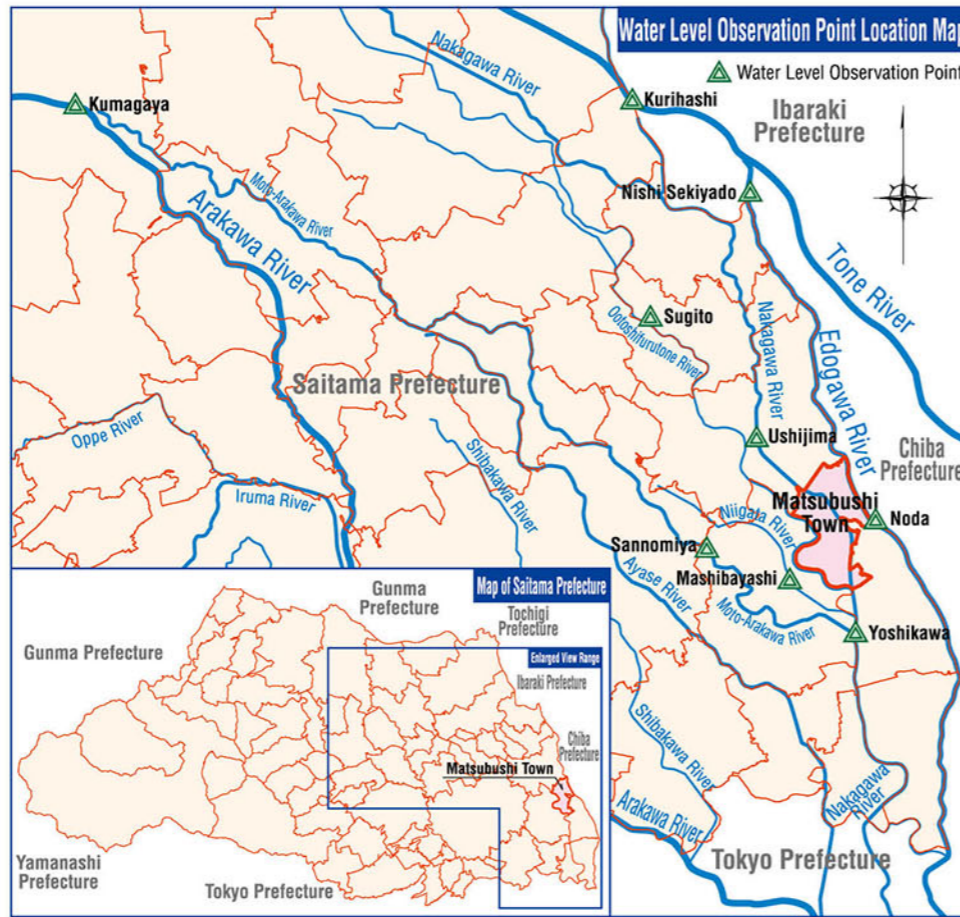
48-hour total rainfall of 596 mm in the Nakagawa and Ayase River basins

#### Arakawa River

72-hour total rainfall of 632 mm in the Arakawa River basin

#### Rivers in the Nakagawa River Basin

48-hour total rainfall of 596 mm in the Nakagawa River basin



\*The expected depth and range of inundation shown on the map are calculated results. Depending on how it rains, areas that are not expected to be flooded may be flooded, or the expected depth may differ from the actual depth.

## How to Use the Flood Hazard Map

A flood hazard map is a map designed to minimize damage. By obtaining information about floods and knowledge of evacuation methods, disaster prevention awareness will increase on a daily basis, and evacuation behavior will be carried out smoothly in the event of a disaster.

Floods are disasters that can be prepared in advance. Use the hazard map to check evacuation routes and dangerous areas, prepare supplies, and collect information to improve safety in an emergency.

### 1 Be informed about the risk of flood damage that is likely to occur in your immediate surroundings

Take a look at the hazard map that shows your living area, such as your home and school, and check whether it is within the expected flooding area, and what the extent and duration of the flooding is expected to be.

### 2 Consider how to evacuate your immediate surroundings

Check your home and evacuation center on the hazard map and consider evacuation routes. Also, walk around and check if there are any dangerous spots.

### 3 Prepare for Floods

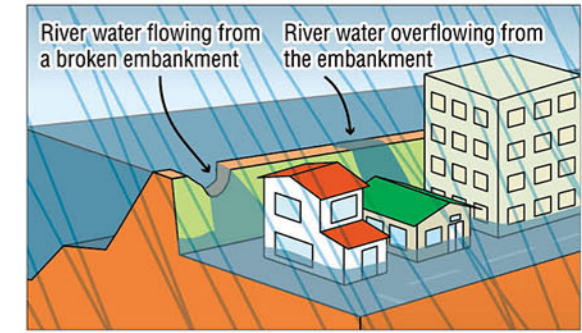
In addition to stockpiling supplies, you can minimize damage by reinforcing your home and confirming how to contact your family in advance. Also, create a My Timeline (see p.45) so that you don't have to panic in an emergency.

## Assumed Wind and Flood Damage in Matsubushi Town

### External water flooding

External water flooding occurs when the water level of a river rises due to heavy rain, etc., and a large amount of water flows into urban areas due to levee breakage or overflow, etc., flooding houses in a short period of time, causing human and property damage.

Even if there is no heavy rain nearby, if there is heavy rain in upstream of a river, the downstream water level will rise and flooding may occur.



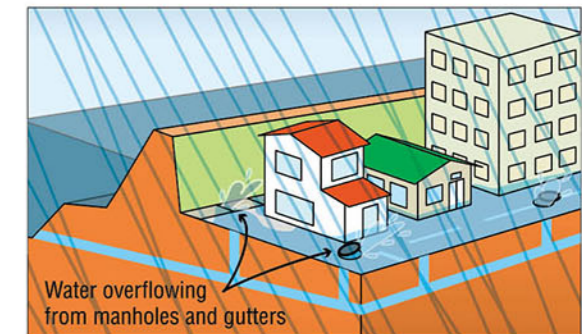
### Inland flood

"Inland water flooding" refers to heavy rain that exceeds the drainage capacity of sewers, etc., or a rise in the water level of a river that prevents "inland water" from draining, overflowing from manholes, etc., flooding land and roads.

Inland flooding caused by localized heavy rain, such as torrential rain, is a typical example of urban flood damage.

\* Since the "Road inundation points (recent flooding results)" shown on the flood hazard map is not a forecast of road inundation points, changes in land use, differences in rainfall and rainfall patterns, for example, flooding may occur even in places where road flooding points are not displayed.

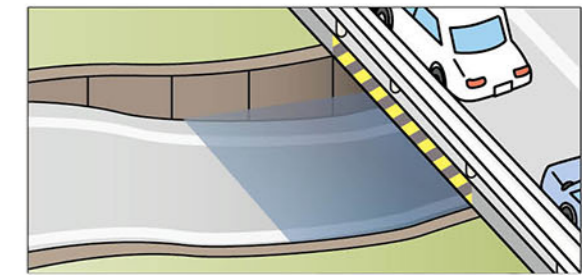
Pay attention to weather information and surrounding conditions even in areas where flooded roads are not displayed.



### Flooding of low roads, etc.

Low roads and underpasses (sections of roads, railways, etc. that go through underground, and the ground is lower than the surrounding area) when sudden heavy rain exceeds the drainage capacity of pumps and drainage channels, may be flooded.

If you drive into a flooded area, the engine will stop and you will be stuck, which is very dangerous.

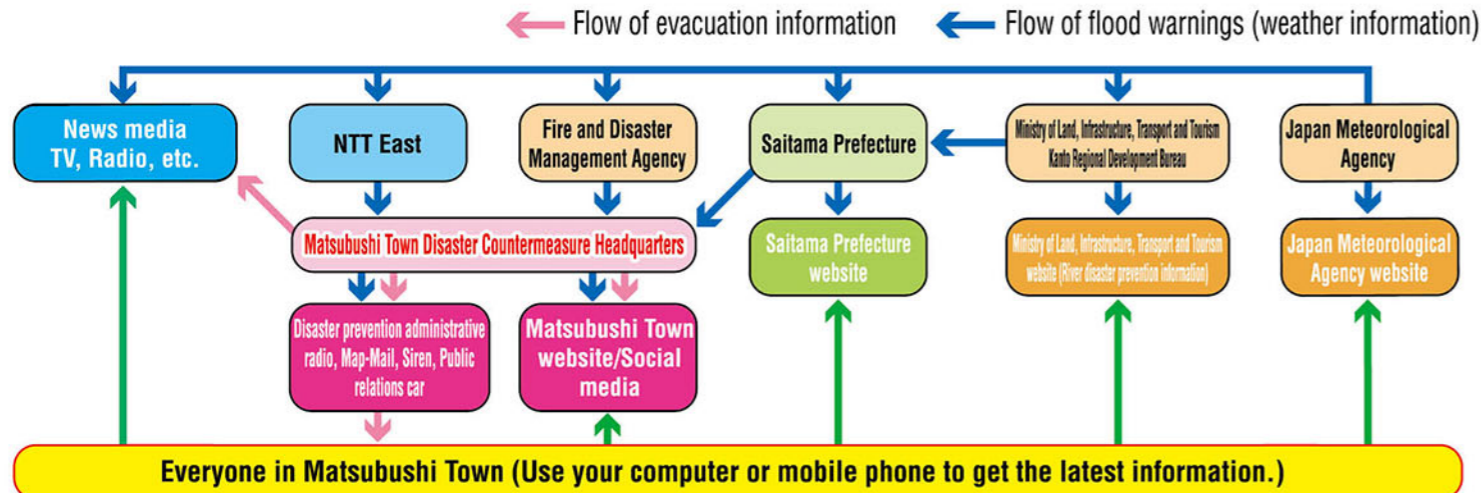


## Relationship between Rainfall Pattern and Rainfall Amount

	Slightly heavy rain 10-20 mm	Heavy rain 20-30 mm	Pouring rain 30-50 mm	Heavy pouring 50-80 mm	Torrential rain 80 mm or higher
Forecast terms 1 hour rainfall (mm)					
Image people perceive	Come down with a thunder	Pouring rain	Pouring like a bucket turned upside down	Pouring like a waterfall (continues to go down)	Suffocating pressure and a sense of fear
Impression on people	Bounce off the ground and get your feet wet	I get wet even with an umbrella		Umbrellas are completely useless	
Indoor	I can't hear your voice well because of the sound of the rain		About half of the sleeping people notice the rain		
Outdoor scene	A puddle can form on the ground		The road becomes like a river	Water splashes make the surrounding area whitish, and visibility becomes poor.	
Driving a car	—	Hard to see even with fast wipers	When driving at high speeds, a film of water forms between the wheels and the road surface, making the brakes ineffective.		Driving a car is dangerous

In the event of a disaster, various types of information will be announced. Always get the latest disaster prevention information and prepare for evacuation. Also, even if no evacuation information has been issued, voluntarily start evacuating if you decide that it is dangerous to stay where you are.

## Transmission Route of Flood Forecast and Evacuation Information



## Disaster Prevention Information to Obtain at the Time of Flood

Be sure to evacuate at **Alert Level 3 or Alert Level 4 (evacuation information)** issued by Matsubushi Town. Voluntarily evacuate early by referring to **river water level and rain information from the Japan Meteorological Agency**.

Evacuation information, etc. (Alert Level)				River water level and rain information (Information Equivalent to Alert Level)			
Alert Level	Situation	Actions Residents Should Take	Evacuation information, etc.	Disaster prevention weather information (Information Equivalent to Alert Level)			
				Flood information (rivers)	Landslide Disaster information (rain)		
<b>5</b>	Disaster Occurrence or Imminence	Your life is at risk Seek safety immediately!	Emergency Safety Measures	Equivalent to <b>5</b>	<b>Flood Occurrence Information</b>	<b>Heavy Rain Special Warning (landslide disaster)</b>	
~~~~~ Be sure to evacuate before Alert Level 4! ~~~~~							
<b>4</b>	High risk of disaster	Everyone should evacuate from hazardous places	Evacuation Instruction	Equivalent to <b>4</b>	<b>Flood Hazard Information</b>	<b>Landslide Disaster Warning Information</b>	
<b>3</b>	Risk of disaster	Elderly etc. should evacuate from hazardous places	Evacuation of the Elderly, Etc.	Equivalent to <b>3</b>	<b>Flood Caution Information Flood Warning</b>	<b>Heavy Rain Warning</b>	
<b>2</b>	Worsening weather conditions	Check your own evacuation behavior	Heavy Rain/Flood Advisory	Equivalent to <b>2</b>	<b>Flood Warning Information</b>	—	
<b>1</b>	Possibility of worsening weather conditions in the future	Increase preparedness for disasters	Early warning information	Equivalent to <b>1</b>	—	—	

Matsubushi Town decides to comprehensively issue **evacuation information (Alert Level)** based on **information on rivers and rain (Information Equivalent to Alert Level)**, as well as local land use and disaster records. The timing and target areas for **level equivalent information** do not always match.

### About water level information

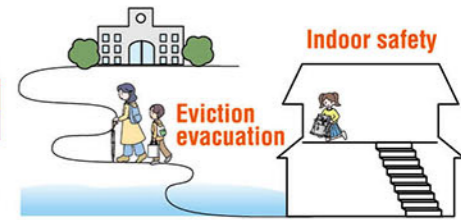
In the water level information, the alert status for flooding is set according to the water level of the river observed at the water level observatory. You can check the water level of the river using "River disaster prevention information".

<b>Flood Hazard Water Level (Equivalent to Alert Level 4)</b>	Water level at which river water may overflow
<b>Evacuation Judgment Water Level (Equivalent to Alert Level 3)</b>	Water level used as a reference for Matsubushi Town to issue an evacuation decision
<b>Flood Warning Water Level (Equivalent to Alert Level 2)</b>	The water level that serves as a guideline for mobilizing flood-fighting organizations to conduct flood-fighting activities
<b>Standby Water Level of Flood Defense Team (Equivalent to Alert Level 1)</b>	The water level that serves as a guideline for flood-fighting organizations to start preparations for flood-fighting activities

## Evacuation Behavior During Floods

### Evacuation is the basics, followed by ensuring indoor safety in an emergency

Evacuation behavior in the event of storm and flood damage is based on evacuating from a dangerous place to a place where there is no risk of flooding before a disaster occurs. When **an evacuation order for the elderly** is issued, the elderly and people with physical disabilities should start evacuating, and when **an evacuation order** is issued, everyone should start and complete the evacuation. However, if you do not have time to evacuate or if it is dangerous to go out due to bad weather, etc., check whether you can secure your safety indoors using a hazard map, etc. Protect your life and body by ensuring safety.



Even if evacuation information (Evacuation Instruction, etc.) has not been issued, if you decide that it is dangerous to stay where you are, voluntarily evacuate and start evacuating. Check the surrounding areas that are not likely to be flooded using the Inundation Area Map of Around Matsubushi Town and the Tone River/Edo River Flood Hazard Map.

**Check the evacuation actions you should take!**  
Cabinet Office disaster prevention information page

## Securing Appropriate Evacuation Destinations (distributed evacuation)

To evacuate means to "avoid" "difficulties". In the event of storm and flood damage, it is basic to evacuate, but it is not necessary to evacuate even those who are in a safe place. Evacuation destinations are not limited to evacuation centers designated by Matsubushi Town. Consider different shelters.

### Evacuation destinations other than designated evacuation shelters (examples)

- A relative's or acquaintance's house or hotel in a safe place  
Consider multiple locations in different regions, such as out-of-town or other prefectures. Always consult your relatives and acquaintances.
- Sleeping in the car in a safe place  
It is dangerous to travel by car during heavy rain or at night. Please check the hazard map in advance to see if it is a safe place, and then carefully check the surrounding conditions.

### About designated evacuation shelters in the town

- Because an unspecified number of people gather in a designated evacuation shelter, privacy is greatly restricted, and the risk of various infectious diseases such as COVID-19 is high. When evacuating, avoid the 3Cs and carry your own mask, disinfectant, thermometer, etc.
- Designated evacuation shelters designated by Matsubushi Town may be changed or expanded. In the event of a disaster, please check the town's website.



## Precautions When Evacuating

### Collecting Accurate Information and Voluntary Evacuation

Use radio, TV, and mobile phones to keep up to date with the latest weather information, disaster information, and evacuation information. Pay attention to how it rains and the situation of flooding, and evacuate voluntarily if you feel in danger.



### Pay attention to calls for evacuation

When danger approaches, the town and the fire brigade will call for evacuation. In that case, please evacuate immediately.

### Wear clothes that are easy to move in and evacuate with two or more people.

When evacuating, wear clothes that are easy to move in, and try to act in groups of two or more. Avoid evacuating alone as much as possible, and call out to each other when evacuating.

### If you are unable to escape, evacuate to a tall building.

In the unlikely event that you are too late to escape and do not have time to reach the evacuation site, evacuate to the highest possible floor of a sturdy building nearby and wait for rescue. Even the second floor of a building can be dangerous in some places.

### Evacuate with a safe evacuation route

Decide on several evacuation routes to your evacuation destination in advance, and evacuate to a safe route from among them.



### Check before evacuation

Before evacuating, check gas, electricity, and fire sources. Confirm evacuation sites and decide what to do if your family is separated on the way. Also, inform your relatives and acquaintances that you are evacuating.

### Be aware of underwater dangers

When evacuating, use elevated roads as much as possible. In flooded areas, be careful of waterways, ditches, and uncovered manholes.

### Avoid evacuating by car and do not leave your car on the embankment

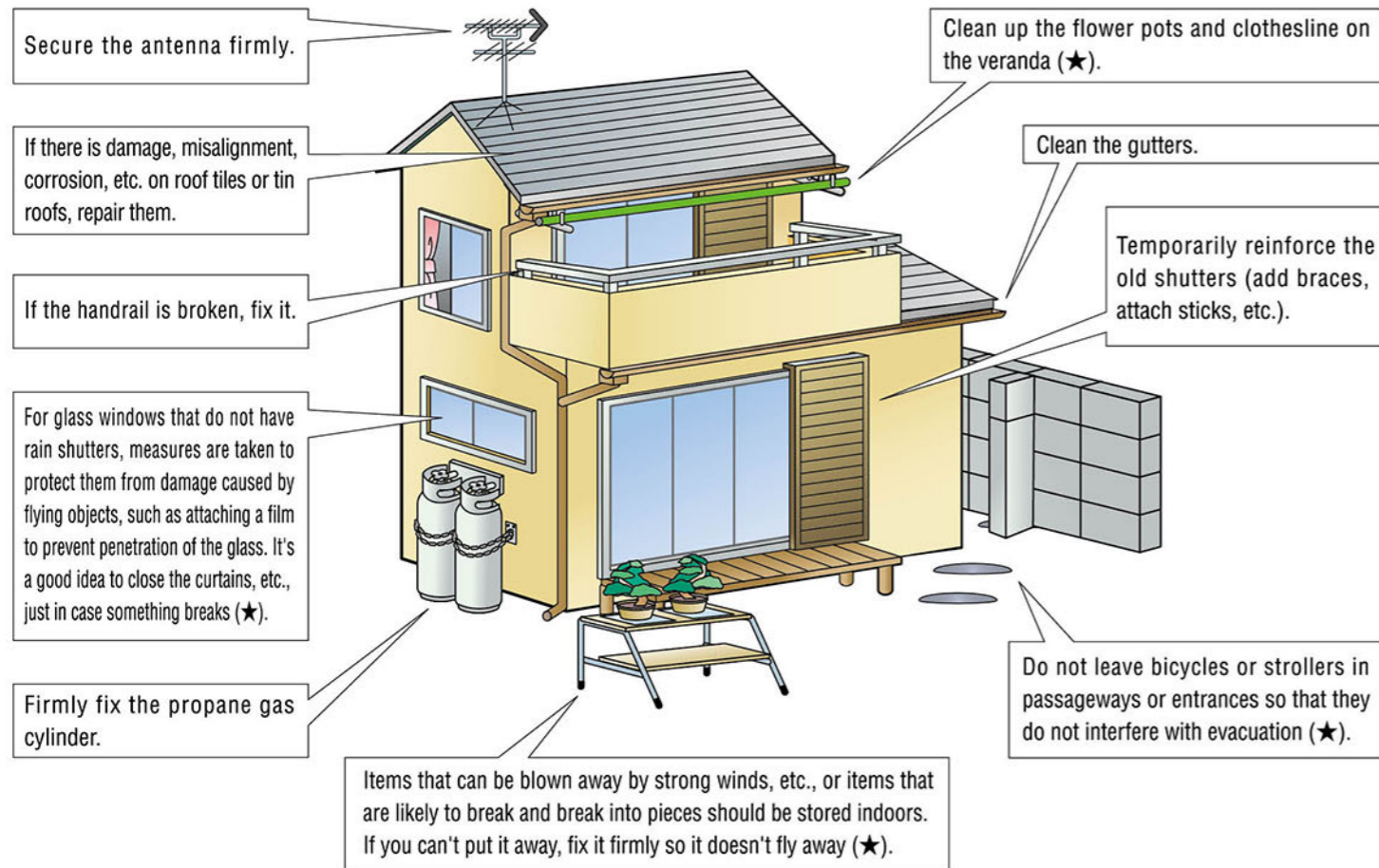
Avoid evacuating by car, as it will block the passage of emergency vehicles. Also, do not leave your car on the embankment or on the road, as it will interfere with flood control activities.

Wind and flood damage is a disaster that can be predicted to some extent. Get the latest disaster prevention information (see page 40) and prepare. Also, be prepared on a daily basis to prevent damage from sudden disasters such as torrential rains.

## Preparing the House and Its Surroundings

Damage can be reduced by checking weather information and taking measures against heavy rain and strong winds. Start preparing for disaster prevention and mitigation before the weather turns bad.

Items marked with a ★ are measures that can be taken by individuals who live in collective housing.



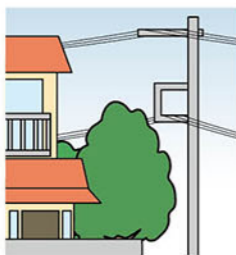
### ◆ Advance preparation for gutters and rainwater troughs

- Clogged road gutters and rainwater catchments can cause road flooding and flooding.
- Do not put a block or the like on top of it.
- Please help us with our daily cleaning.



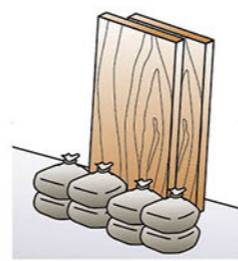
### ◆ Tree pruning (management)

- Power outages and communication failures may occur for a long time when power lines and telephone lines are disconnected due to fallen trees.
- In order to prevent such accidents, the owner of the tree is requested to take appropriate measures such as felling and trimming branches.



### ◆ Preparing for flooding

- If flooding is expected, prepare sandbags and waterstops.
- For semi-basement buildings and houses with basements, be sure to take measures against flooding, such as maintenance and inspection of drainage equipment (pumps).



### ◆ Danger of underground space

- When flooded, water enters the underground space from unexpected places such as ventilation openings and lighting windows, and the pressure of water from the aboveground makes it impossible to open and close the door. Also, the power outage makes it pitch black.
- If the weather outside changes, move out of the underground space. Also, do not store stockpiles (see p.38) and flood prevention items such as sandbags in underground spaces.

## Measures Against Indoor Flooding

### ◆ Moving household goods

- Move your household goods and appliances to a higher place or to the second floor to prevent them from being damaged by the flood.
- Electrical outlets can cause short circuits, electric shocks, etc. Unplug electrical appliances, etc., and move low-lying items to higher places.



### ◆ Backflow prevention from the drain port

- Place water bags on top of bathroom drains, washing machine drains, and toilet bowl puddles to prevent backflow.
- You can easily make a water bag out of a plastic bag at home.



### How to make a simple water bag

- Double the plastic bags (about 45 liters) such as garbage bags, fill about half with water, and tie the mouth of the bag.



### How to use a simple water bag (flood prevention)

- It is used side by side without gaps such as entrances. If you put it in a cardboard box and connect it, the strength will increase.



## Prepare for Evacuation

### ◆ For a Safe Evacuation

- Confirm a safe evacuation route with your family in advance. Take detours near rivers and bridges, even if it's a shortcut.
- Check the "Marugoto Machigoto Hazard Map" near your home. The estimated inundation depth and evacuation sites are indicated.
- Create a "My Timeline" and organize your evacuation actions in advance (see P45). Each person's evacuation behavior is different. Act without panic with "My Timeline" that suits individuals and regions.



### ◆ Prepare emergency items and equipment

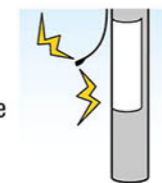
- Prepare emergency items (see P39). Food and blankets may not be provided immediately at evacuation centers.
- Prepare clothes that can be safely evacuated, such as rain gear and sports shoes. Boots are not suitable for flooding, as water will get inside and you will not be able to move.



## Action after a Flood

### ◆ Check for any severed connections

- Check for broken wires.
- If you find a severed connection, report it to the power company or telephone company.
- Do not go near broken power lines.



### ◆ Check for falling objects

- Check the roof tiles and antennas for damage.
- If there is a danger of falling, remove or repair it.



### ◆ Check and remove dangerous goods

- Check for leaks of gas, oil, etc. and propane gas cylinders.
- If you discover danger, report it to the people around you, the gas company, and the fire department.



### ◆ Check the septic tank

- Check to see if there are any severed connections, if the lid has come off, and if the drug cylinder has fallen over.
- Check for damage to the pump, blower, and upper part of the concrete septic tank.



### ◆ Thorough hygiene measures [The basics of water damage cleanup are dirt removal → drying → disinfection]

#### ● Indoors

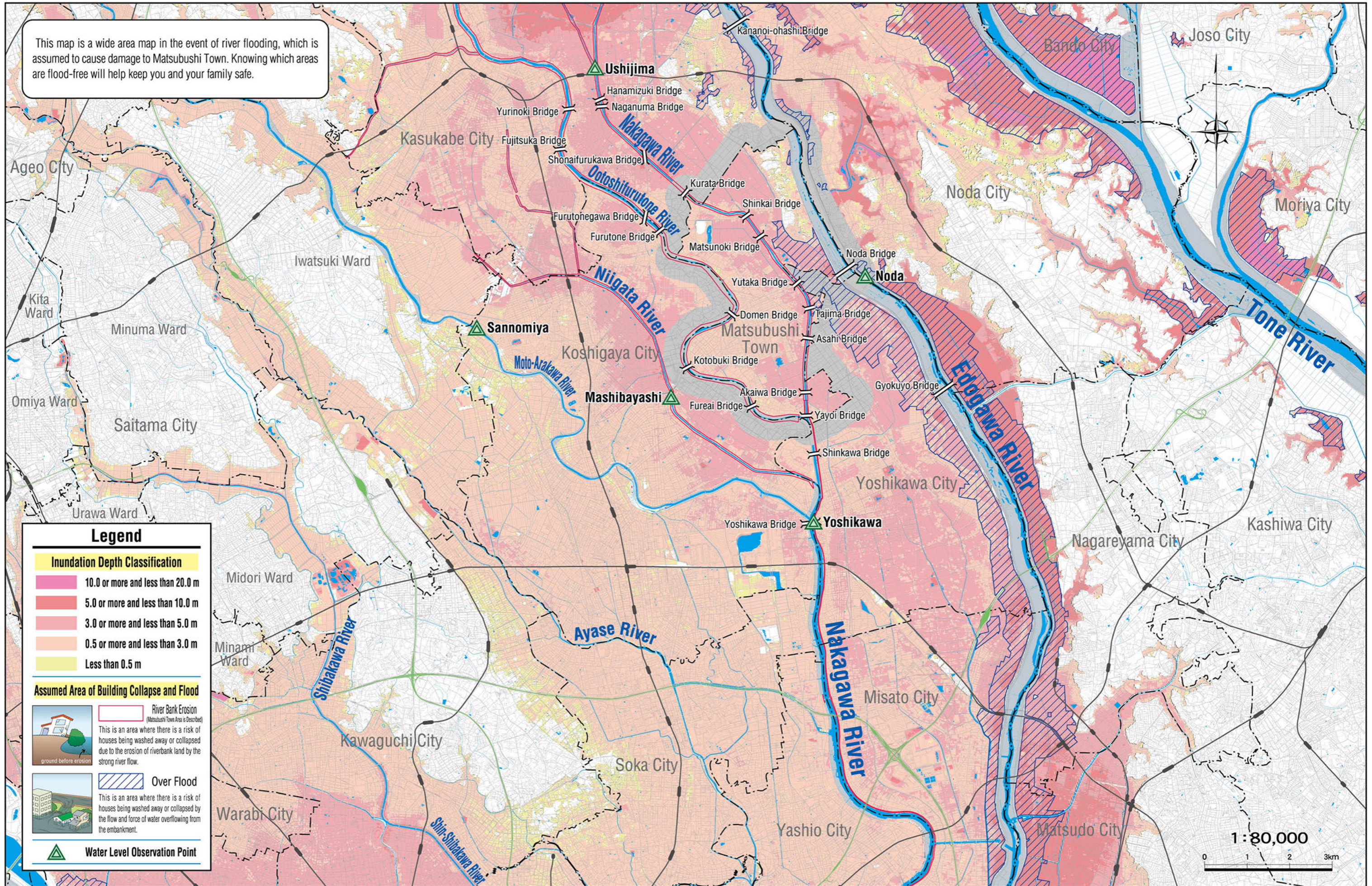
After thoroughly removing mud and dirt by washing and wiping, disinfect. Wash dishes that can be washed with water, and wipe off dirt from refrigerators that cannot be washed with water.

#### ● Outdoor/Underfloor

Remove soil and sand from the outdoor area and under the floor, rinse with tap water, and dry thoroughly. Leaving moisture can damage the foundations and foundations of your home. Let it dry completely.

# Inundation Area Map of Around Matsubushi Town (target river synthetic version)

This map is a wide area map in the event of river flooding, which is assumed to cause damage to Matsubushi Town. Knowing which areas are flood-free will help keep you and your family safe.






### Legend

#### Inundation Depth Classification

- 10.0 or more and less than 20.0 m
- 5.0 or more and less than 10.0 m
- 3.0 or more and less than 5.0 m
- 0.5 or more and less than 3.0 m
- Less than 0.5 m

#### Assumed Area of Building Collapse and Flood

-   River Bank Erosion (Matsubushi Town Area is Described)  
This is an area where there is a risk of houses being washed away or collapsed due to the erosion of riverbank land by the strong river flow.
-   Over Flood  
This is an area where there is a risk of houses being washed away or collapsed by the flow and force of water overflowing from the embankment.
-   Water Level Observation Point

1:80,000

0 1 2 3km

# Tone River Flood Hazard Map (Northern)

Once the Tone River levee is breached, flood water is expected to reach Matsubushi Town in about seven hours at the earliest.

## Concerning flood conditions assumed for the Tone River

Flooding of the Tone River is assumed when heavy rain falls in the basin and the Tone River overflows. The expected maximum rainfall is 491 mm in 72 hours in the Tone River basin and upstream of Yattajima.

The inundation range and inundation depth on this map are based on the results of flood predictions, and are the maximum conditions that are superimposed on the inundation area and inundation depth due to all the assumed levee break points of the Tone River.

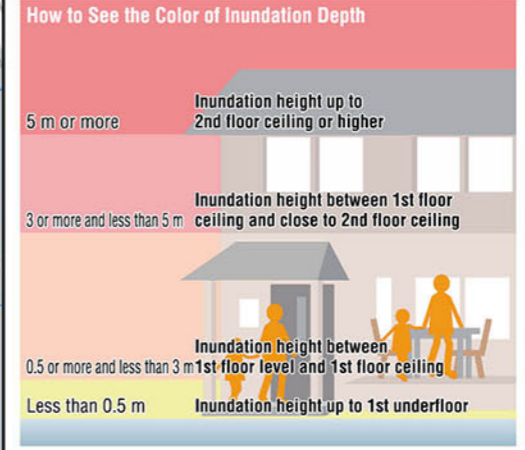
## Index Map



## Assumed Inundation Situation

- Flood water moves from north to south.
- It is expected that the flood water will arrive about 7 hours after the river floods.

## Approximate Expected Inundation Depth



## Legend

### Inundation Depth Classification

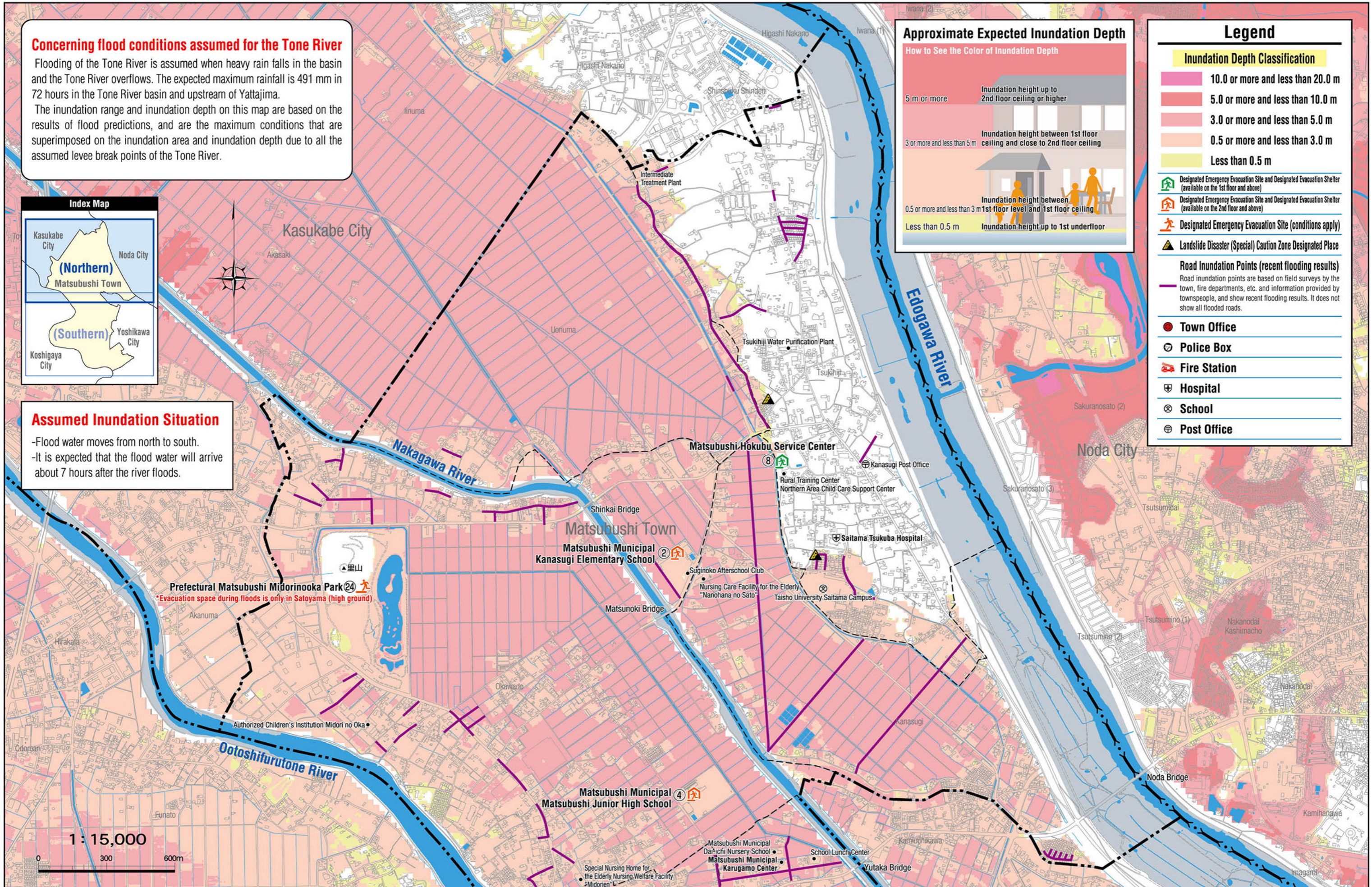
- 10.0 or more and less than 20.0 m
- 5.0 or more and less than 10.0 m
- 3.0 or more and less than 5.0 m
- 0.5 or more and less than 3.0 m
- Less than 0.5 m

- Designated Emergency Evacuation Site and Designated Evacuation Shelter (available on the 1st floor and above)
- Designated Emergency Evacuation Site and Designated Evacuation Shelter (available on the 2nd floor and above)
- Designated Emergency Evacuation Site (conditions apply)
- Landslide Disaster (Special) Caution Zone Designated Place

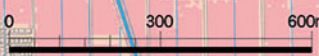
### Road Inundation Points (recent flooding results)

Road inundation points are based on field surveys by the town, fire departments, etc. and information provided by townspeople, and show recent flooding results. It does not show all flooded roads.

- Town Office
- Police Box
- Fire Station
- Hospital
- School
- Post Office



1:15,000



# Tone River Flood Hazard Map (Southern)

Once the Tone River levee is breached, flood water is expected to reach Matsubushi Town after about seven hours, at the earliest.

