

じょうようし ぼうさい ぶく 城陽市防災ブック

Joyo City Disaster Preparedness Book

こうずい どしゃさいがい じしんさいがい そな
洪水・土砂災害・地震災害への備え

For use in the event of severe flooding, landslides, and earthquakes

Photo taken near Kintetsu Terada Station during the flood of 2012
(August 14th, 2012)



じょうよう し
城 陽 市

The City of Joyo

Introduction (about the publication of this disaster preparedness book)

The 2011 Great East Japan Earthquake, the landslide that greatly affected Hiroshima City in August 2014, the flooding of the Kinugawa River in September 2015 that resulted in severe damage across the Kanto and Tohoku area- in recent years, large-scale disasters like these are occurring all across Japan. We don't know when or where a disaster will happen.

To this end, we have published “The Joyo City Disaster Preparedness Book”, a preparedness guide complete with data from past disasters, as well as anticipated damage estimates and hazard maps for the future.

It is our wish that you use the information in this book to educate and prepare countermeasures in the event of a natural disaster.



Mayor Toshiharu Okuda
March 2018

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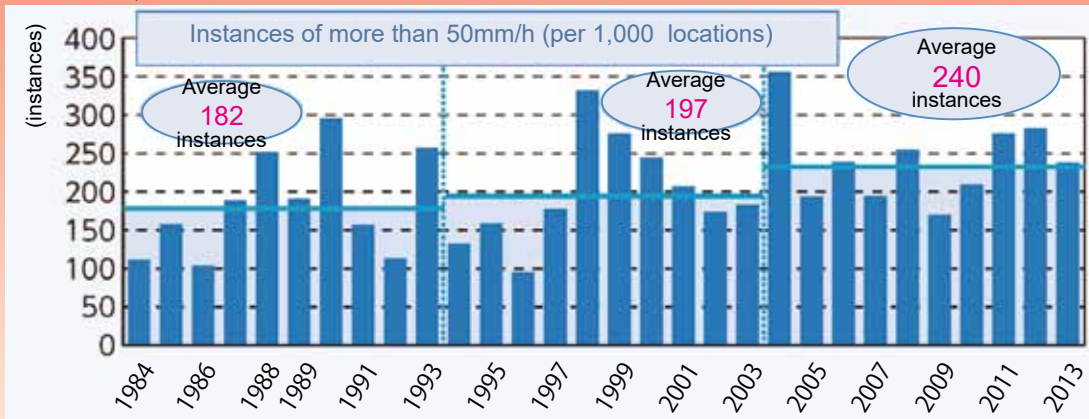
1. Flooding

In recent years, frequent flooding as a result of heavy rain is causing severe damage throughout Japan.

The effects of inundation from typhoons and Japan's seasonal rains (called "deluge") are felt even in Jojo. This can result in the flooding of both external and internal waterways within the city.

About Heavy Rainfall ~ the increase in rainfall limited by regions follows~

The most recent decade (2003-2013) has seen an increase in heavy rainfall (50mm/hour, 2in/h) approximately **1.2 times** that of the previous decade (1993-2003).



※ 50mm/h of rainfall is defined by rainfall so heavy one cannot use an umbrella

(2014 data provided by the Ministry of the Environment)

External Flooding (rivers)

External flooding is when heavy rainfall causes riverbanks and levees to overflow and flood. In Jojo, the Kizugawa, Furukawa, Hasegawa, and Aodanigawa rivers are most at risk of causing severe damage in the event of a flood.



Internal Flooding (sewage, spillways, etc.)

Internal flooding is when rainwater as a result of sudden, heavy rainfall is unable to flow into the rivers and levees, causing sewage lines and spillways within the city to overflow and flood.

Rains that cause this kind of flood are sudden and unpredictable so please exercise caution.



2. Landslides

In Joyo, landslides can occur due to heavy, continuous rainfall or earthquakes. Below is an infographic on how to recognize warning signs of an impending landslide.

Learn to recognize landslide warning signs and always be ready to evacuate in the event of a landslide. See “Warning Signs of a Landslide” below.

Sharp Slopes in the Land from Earthquakes

Slopes begin to suddenly slide and become unstable, as a result of excess rainwater or earthquakes



Sloping Land from the Notohanto Earthquake (2007)

Debris Flow

Soil and debris from mountains and ravines suddenly begin to flow downstream.



Heavy Rain in Chugoku and North Kyushu (2009)

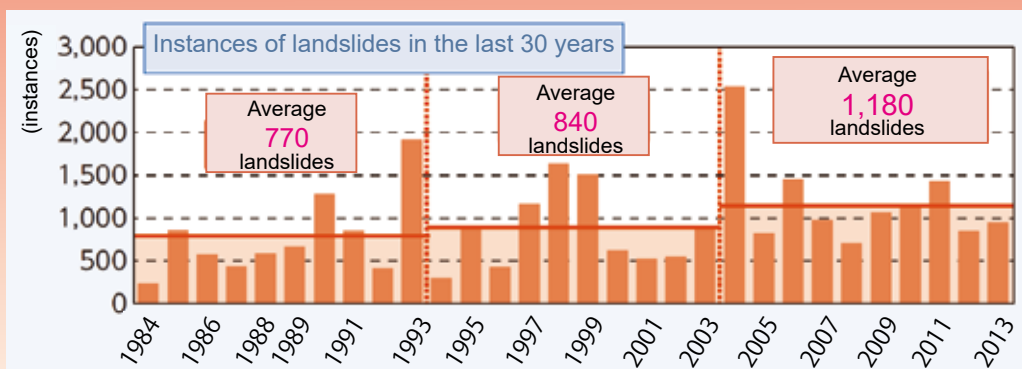
Source: Disaster Photo Database (General Foundation Fire Information Res. Center)

● Warning Signs of a Landslide

- ① Cracks appear in slopes. Small rocks begin to occasionally fall.
- ② Sounds can be heard from cracked slopes and mountains.
- ③ Groundwater becomes dirty and spouts from the ground.
- ④ Flowing water (from valleys, etc) becomes dirty, surrounding soil has a foul odor.
- ⑤ Water levels fall or suddenly lessen despite continuous rain.



About landslides ~the yearly increase of landslide instances is depicted below~
The most recent decade (2003-2013) has seen an increase in instances of landslides approximately **1.4 times** that of the previous decade (1993-2003).




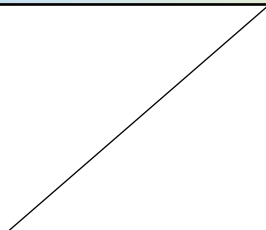





2014 Ministry of the Environment

3. Weather Conditions and Evacuation Procedures

In the event of a natural disaster caused by heavy rain or a typhoon, it is imperative to understand the appropriate weather conditions and evacuation procedures as well as evacuation sites in Joyo City. Additionally, be mindful of your and others' safety when evacuating.

● Evacuation Information and Protocols

Level of rain	Strong rain	Heavy rain		Uncommon heavy rain
				
Provided by the Japanese Meteorological Society (JMA)				
Warnings • Advisories	Storm Advisory • Flood Advisory	Storm Warning • Flood Warning		Emergency Storm Warning
		Landslide Alert		
Classification		Alert Level 3	Alert Level 4 (Mass Evacuation)	
		Advisory to prepare for evacuation and start evacuating elderly and other persons requiring special care	Evacuation Recommendation	Evacuation Instruction (Emergency)
Procedures	In the event of a thunderstorm or flood warning at night, always be prepared to evacuate with little notice.	People who require additional time to evacuate (elderly, persons with disabilities or infants, etc) and their attendants evacuate at this time.	Immediately evacuate to a safe evacuation site.	Anyone who has not yet evacuated please do so at this time.
	Additionally, be sure to check if your residence is within an affected early evacuation zone for flooding or landslides.			
For more on evacuation protocols and how to obtain information about natural disasters, see page 20.				

This chart is meant as a guideline. Please exercise your best judgment and act according to your situation.

4. Evacuation Protocols for Flooding and Landslides

In Jojo, there are areas at risk of landslides and floodwater (sometimes reaching up to the 2nd floor of a building).

Check your area to confirm your risk status, and should you receive an order to evacuate, please do so immediately.

Landslides

Landslide Hazard Area

Areas Susceptible to Landslides

Emergency Landslide Hazard Area

Areas at Risk of Severe Damage from Landslides

※ For information on landslide hazard areas and more, please check the prefectural website.
[Kyoto Prefecture, Japanese only] <http://www.pref.kyoto.jp/dosyashitei/shiteitop.html>

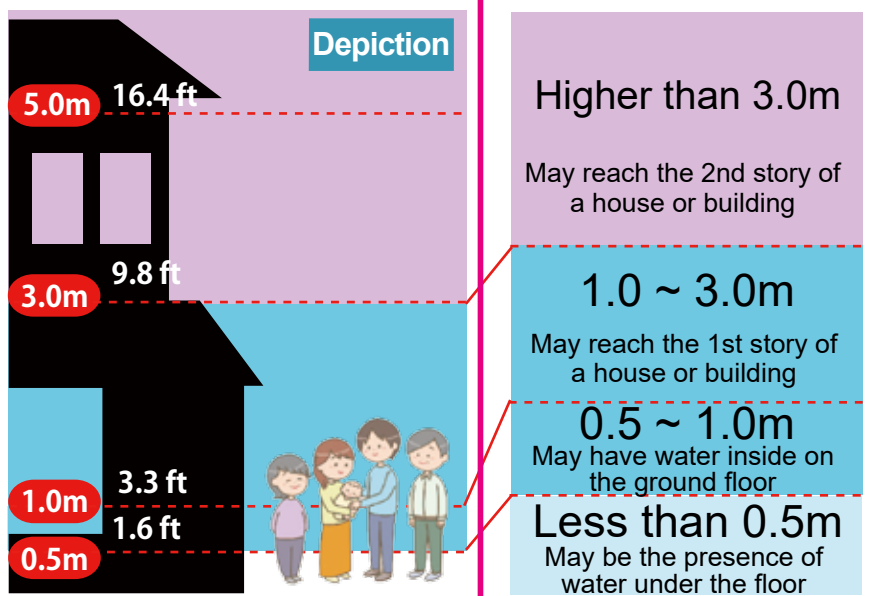


Flooding

Early Flood Evacuation Zones

The following numbers ① ~ ③ detail conditions under which life and bodily safety can be at risk.

- ① Floodwaters that exceed 0.5m (above knee height in adults or the ground story of a house or building)
- ② Floodwaters that exceed 1.0m (above waist height in adults)
- ③ Floodwaters at which level houses and buildings may be damaged or swept away with the current



Evacuate from high-risk areas

During a landslide or flood, there can be risk to life and bodily safety.

It is imperative to escape before a natural disaster happens

For Those Not in High-Risk Areas

The chance of a landslide or flood is low, but please be aware that heavy rain can cause inundation even in low-risk areas.

Wait it out

Exercise your own judgment and wait in a safe location in your home.

5. How to Use Flood and Landslide Hazard Maps

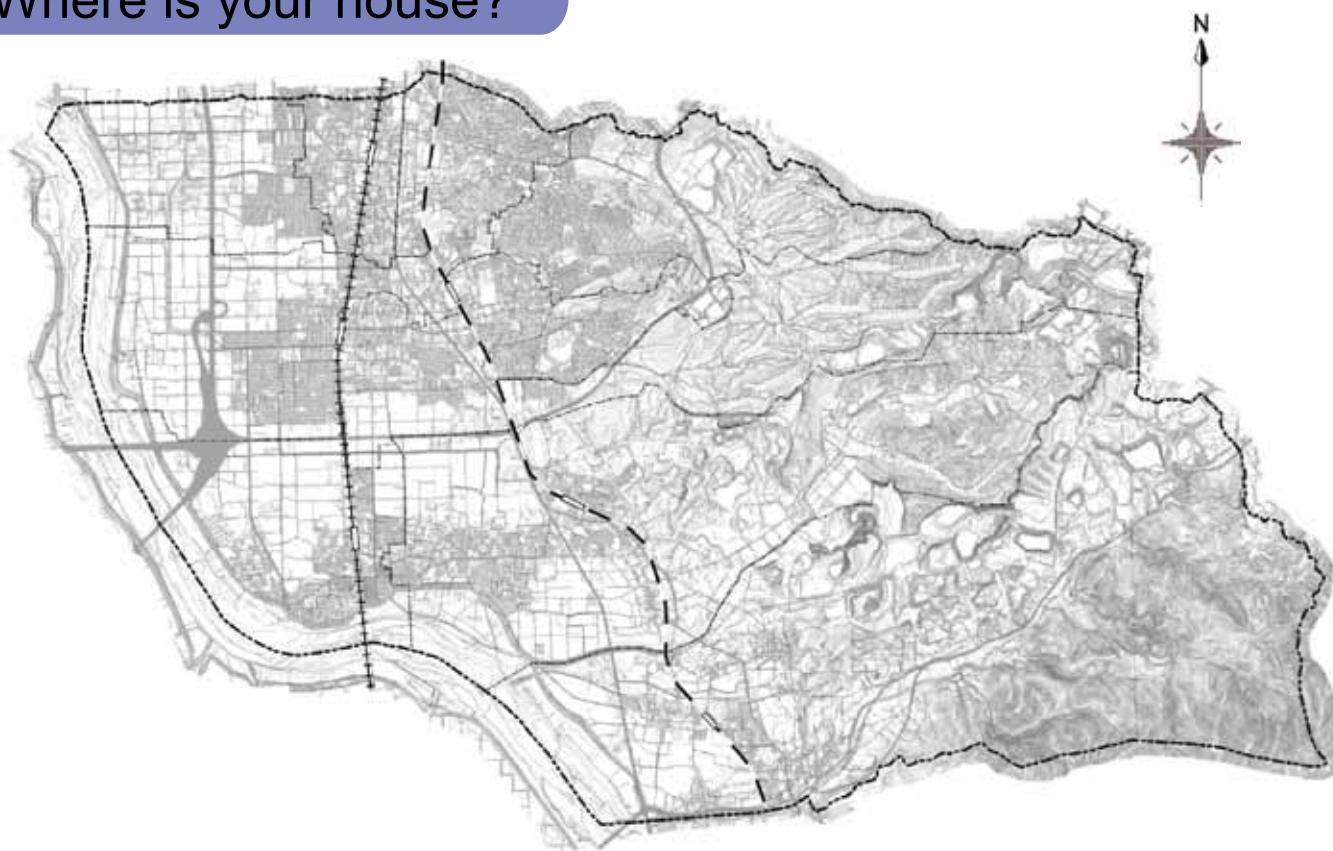
Use this hazard map to check areas where landslides and flooding can occur (complete with estimated water levels measured from ground level). Think ahead and know the way to your nearest evacuation site before a disaster happens.

Please note that some roads will become unusable during a natural disaster so prepare at least 2 alternative routes just in case.

P6~P7: External Flooding (Kizugawa, Furukawa, Hasegawa, and Aodanigawa River Hazard Maps)

P8~P9: Internal Flooding (sewage, spillways, etc.)

Where is your house?



Map Key



At-risk areas for early flooding



At-risk areas for landslides
(collapsing of steep slopes and hills)



At-risk areas for debris flow
(rocks, soil, etc)



Designated Evacuation Sites

A place where one can evacuate to either after or prior to a natural disaster is called an "evacuation shelter".



Designated Evacuation Site
(open space)



Joyo City Hall



Police Office •
Police Box

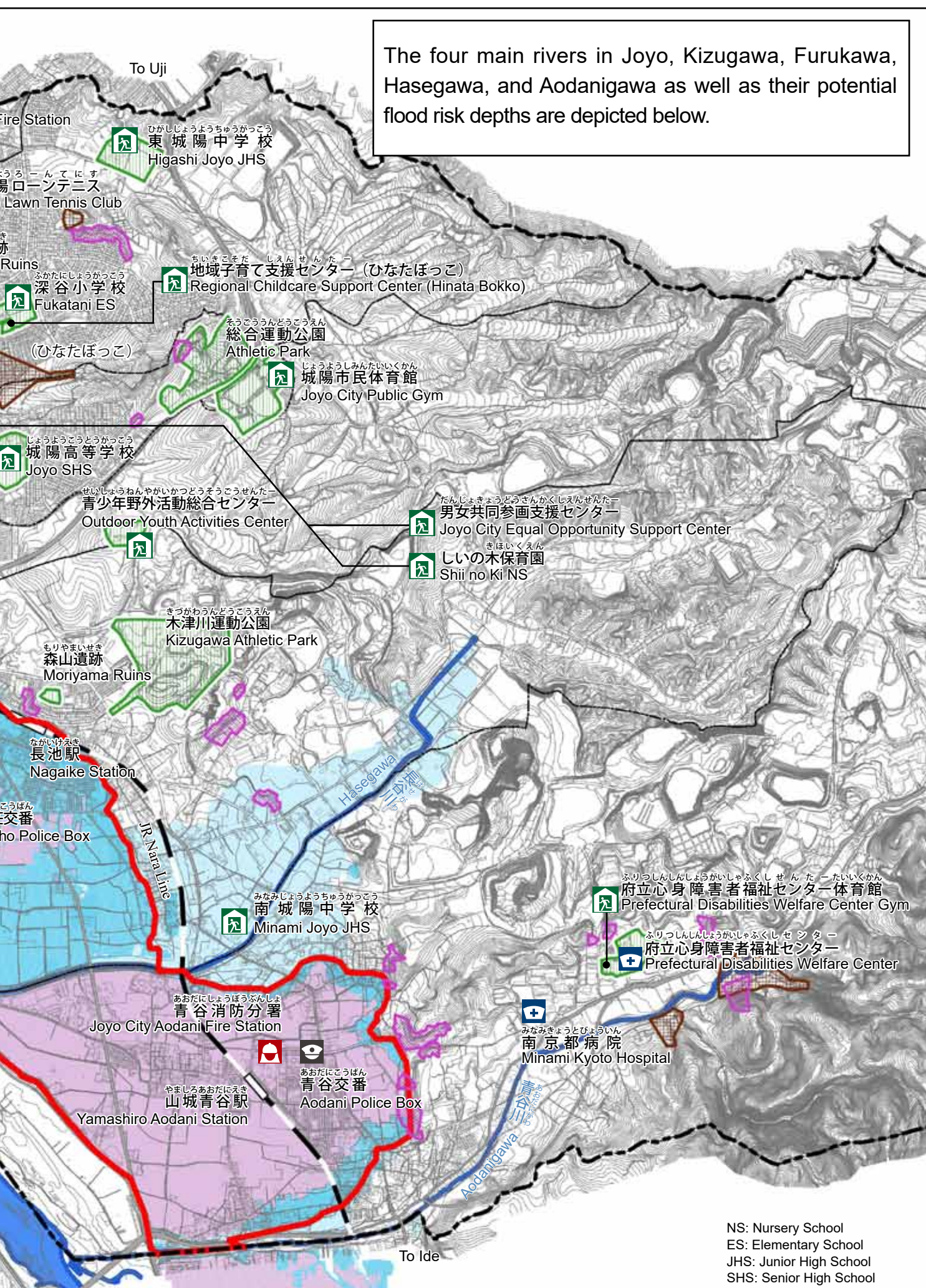


Fire Station



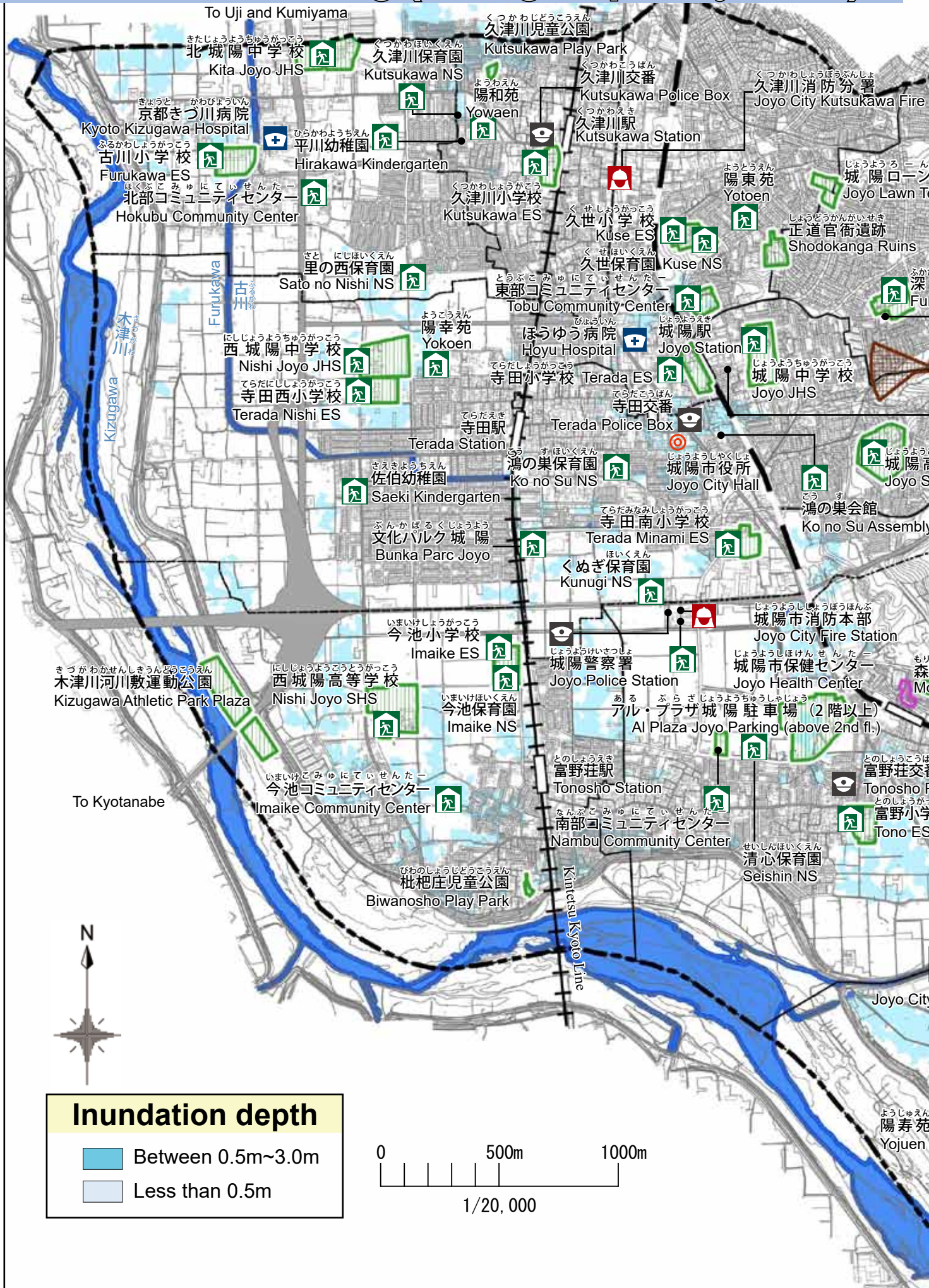
Hospital

The four main rivers in Joyo, Kizugawa, Furukawa, Hasegawa, and Aodanigawa as well as their potential flood risk depths are depicted below.



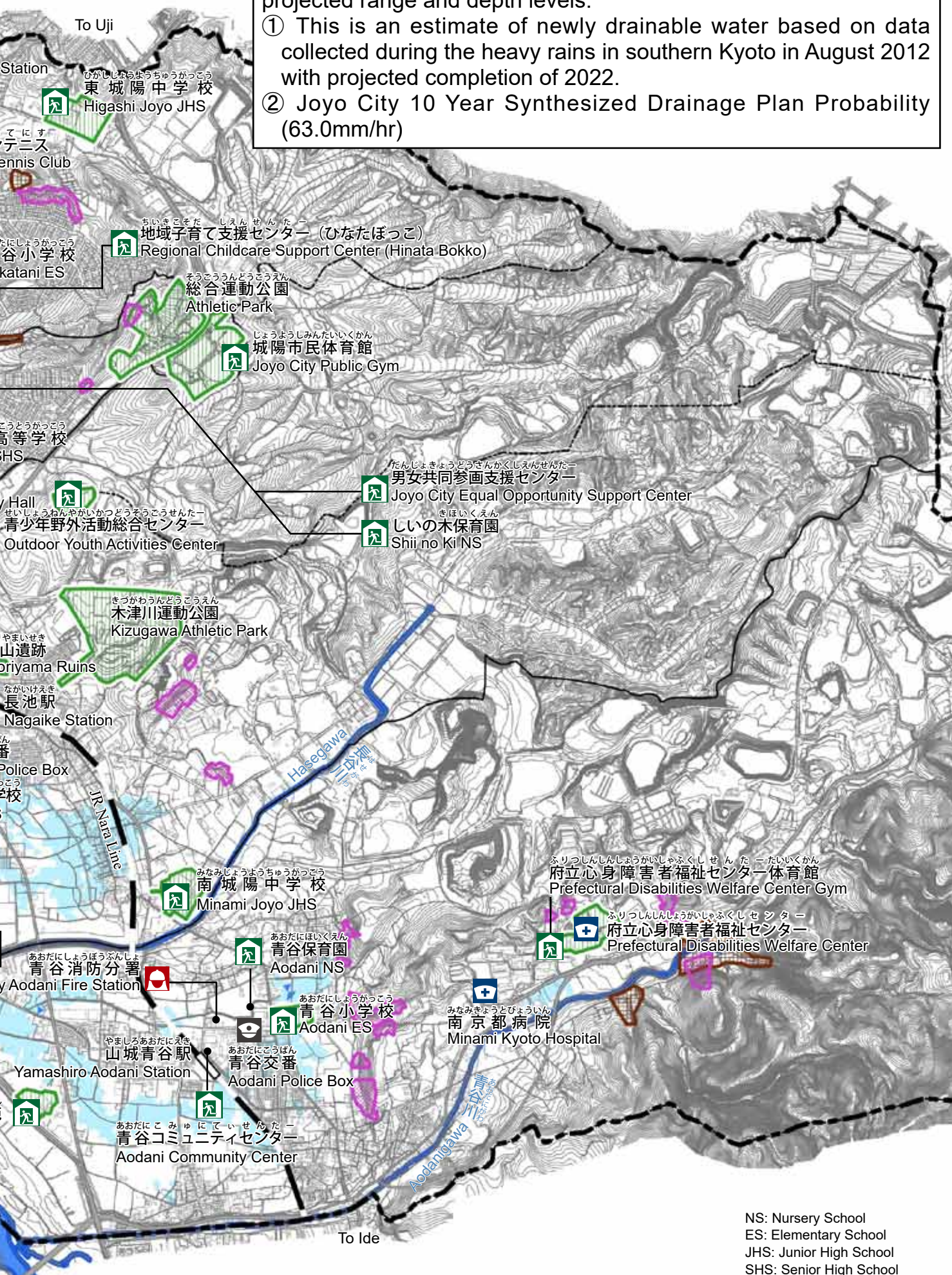
NS: Nursery School
 ES: Elementary School
 JHS: Junior High School
 SHS: Senior High School

7. Internal Flooding (sewage, spillways, etc.)



These flood estimates are based on predictions and include projected range and depth levels.

- ① This is an estimate of newly drainable water based on data collected during the heavy rains in southern Kyoto in August 2012 with projected completion of 2022.
- ② Joyo City 10 Year Synthesized Drainage Plan Probability (63.0mm/hr)

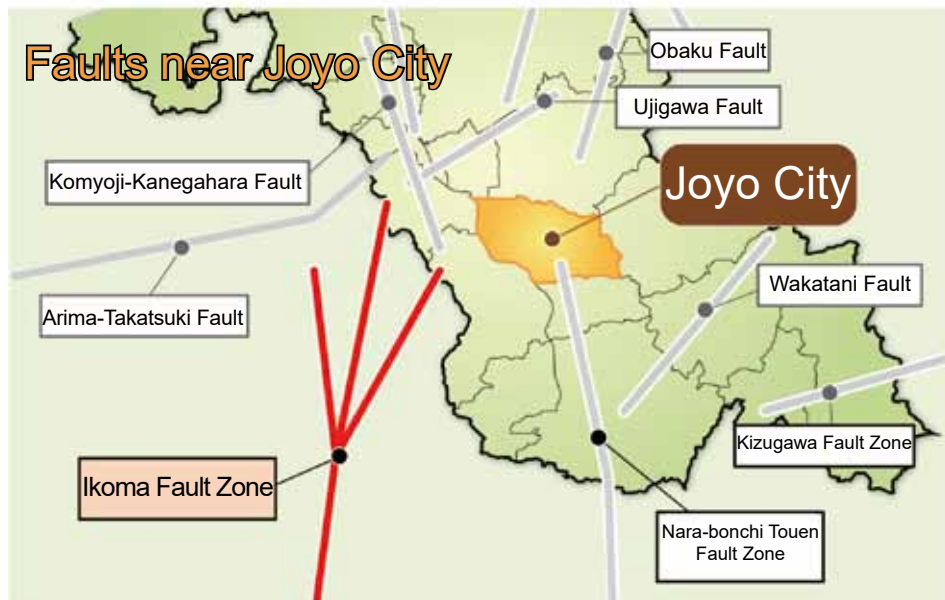


NS: Nursery School
ES: Elementary School
JHS: Junior High School
SHS: Senior High School

8. Earthquakes

8-1. Ikoma Fault Zone Earthquake

In Kyoto Prefecture, there are 22 faults and fissures. In Joyo, it is predicted that the heaviest damage will be from earthquakes on the Ikoma Fault Zone.

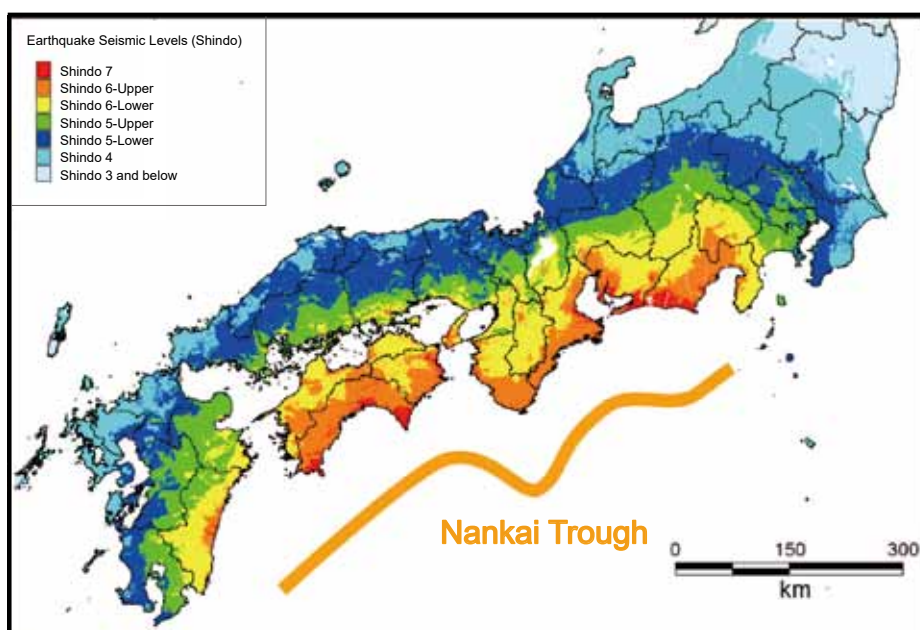


Earthquake Damage Estimates in Joyo

Ikoma Fault Zone Earthquake		
Maximum predicted seismic intensity		7
Casualties	Death toll	720
	Injured	4,130
	People in need of help	3,150
Buildings damaged	Buildings destroyed	10,670
	Buildings half or partly destroyed	10,350
	Buildings damaged by fire	1,230

8-2. Nankai Trough Mega-Quake

In the middle of the Pacific Ocean is a fault that runs from Shizuoka Prefecture through Shikoku called the Nankai Trough that is 4,000m deep and capable of large-scale earthquakes. There is a 70~80% probability of a major earthquake from this area within 30 years. (a statement from MEXT's Research Institution, February 2018)



Earthquake Damage Estimates in Joyo

Nankai Trough Mega-Quake		
Maximum predicted seismic intensity		Shindo 6-Upper
Casualties	Death toll	70
	Injured	910
	People in need of help	150
Buildings damaged	Buildings destroyed	980
	Buildings half or partly destroyed	-
	Buildings damaged by fire	6,030

Referenced in a report by the government in May 2013

Damage from the Nankai Trough Mega-Quake is expected to be severe and widespread. It's predicted that neighboring prefectures will be unable to offer support.

Earthquakes and Seismic Data

In Japan, earthquakes have a seismic intensity from Shindo 1 (lowest) to Shindo 7 (highest).

During an earthquake, protect yourself and wait for the shaking to subside.

※ Also be aware of aftershocks, earthquakes that occur after the initial quake.



Aftermath of the Great Hanshin Earthquake of 1995



Niigata-Chuetsuoki Earthquake of 2004

Source: Natural Disaster Photo Database (General Foundation Fire Information Res. Center)

Shindo 1

(Seismic intensity 1)

People in a quiet room may be able to notice shaking.

Shindo 2

More than half of the people in a quiet room will notice shaking.

Shindo 3

Almost everyone in a room will notice shaking.

Shindo 4



- Almost everyone will be alarmed by the degree of shaking.
- Suspended structures like telephone poles will sway.

Shindo 6-Lower



- Standing becomes almost impossible.
- The majority of unsecured furniture will fall and move around.
- Wooden buildings which are not earthquake-proof may suffer damage and beams may collapse.

Shindo 5-Lower



- More than half of the people present will feel panic.
- Books and dishware may fall from shelves.
- Unsecured furniture will move, unstable items will fall.

Shindo 6-Upper



Earthquake-proof buildings

Non-earthquake-proof buildings

- It's impossible to move without crawling. People may become airborne.
- Nearly all unsecured furniture will move and may fall.
- Wooden buildings which are not earthquake-proof may collapse.

Shindo 5-Upper



- Walking will be difficult without support.
- The majority of books and dishware will fall from shelves.
- Unsecured furniture may fall.

Shindo 7



Earthquake-proof buildings

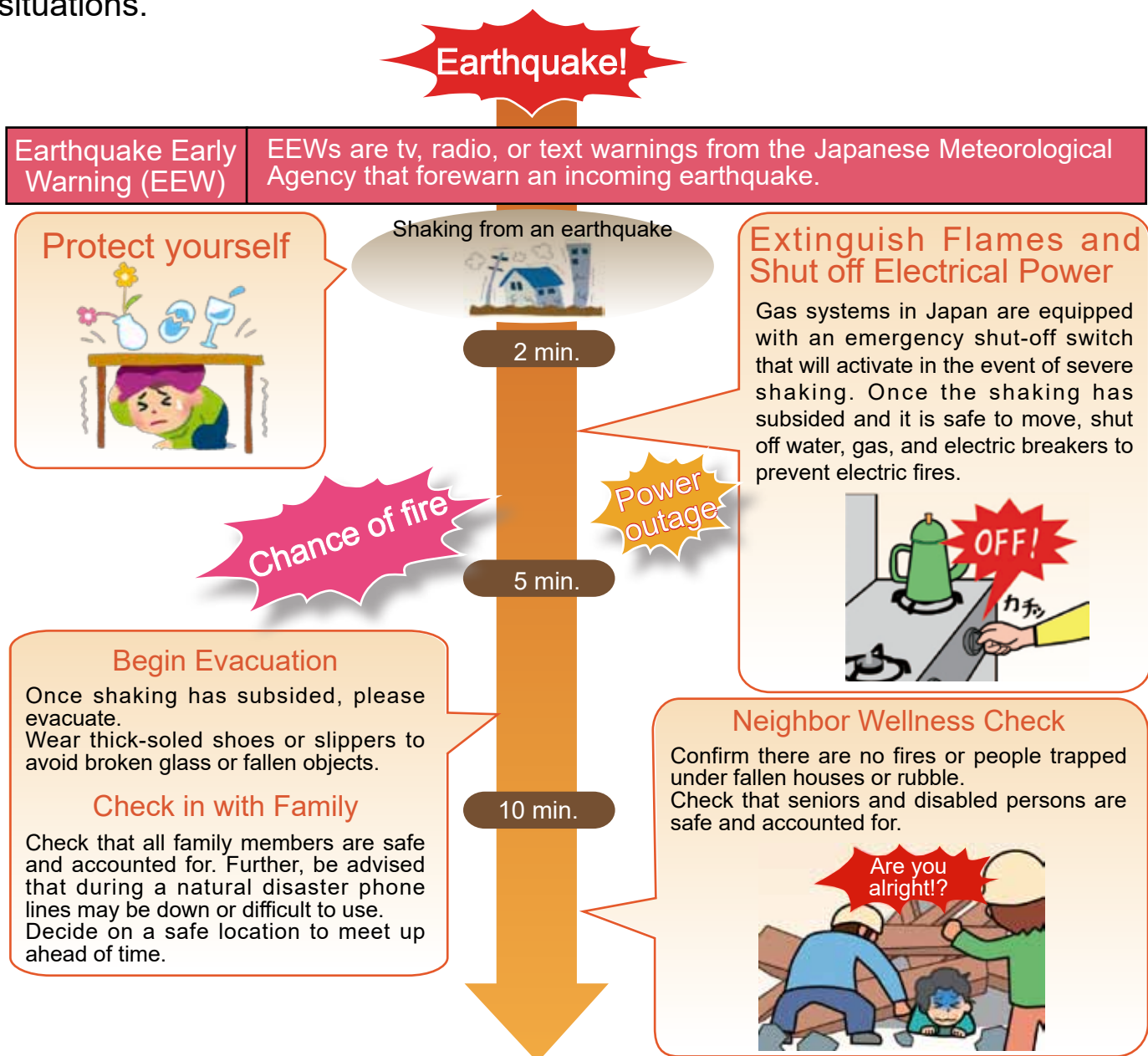
Non-earthquake-proof buildings

- Wooden non-earthquake-proof buildings will collapse.
- Wooden non-earthquake-proof buildings may sink into the earth.
- The majority of non-earthquake proof concrete buildings will collapse.

9. Earthquake Evacuation Protocols

● Earthquake Evacuation Procedures

In the event of an earthquake, it's important to remain calm before acting. It's crucial to keep in mind that an earthquake can happen at any time (early morning, late night, at work or school, etc.), and to prepare for many situations.



Go to an Evacuation Shelter

Cooperation is needed for peaceful living in an evacuation shelter.



1. An evacuation shelter is a place where those who cannot return home can temporarily live.
2. Elementary and junior high schools are examples of such places.
3. There will be many people and various rules for living peacefully in an evacuation shelter.
4. Evacuation shelters are free and open to everyone.

Evacuating with a Pet

- Be sure your pet does not bother other residents of the shelter.
- Animals and humans live separately at the evacuation shelters. (Service animals are exempt from this rule.)
- Take anything your pet may need when you evacuate.

● Before the Tremors (What You Can Do to Prepare)

The majority of casualties during a large earthquake are from suffocation or injuries sustained from collapsing buildings. Knowing this, it's important to take appropriate measures to make sure your home is proofed for earthquakes to protect yourself and your family.

Furthermore, furniture and power lines can also cause severe injury during an earthquake so make sure they are properly secured.



Image of the 2007 Noto Earthquake



Image of 2008 Iwate-Miyagi Earthquake

Source: Natural Disaster Photo Database (General Foundation Fire Information Res. Center)

■ Earthquake-proofing Your Home

In Jojo, many protective measures are being taken to hasten recovery from an earthquake.

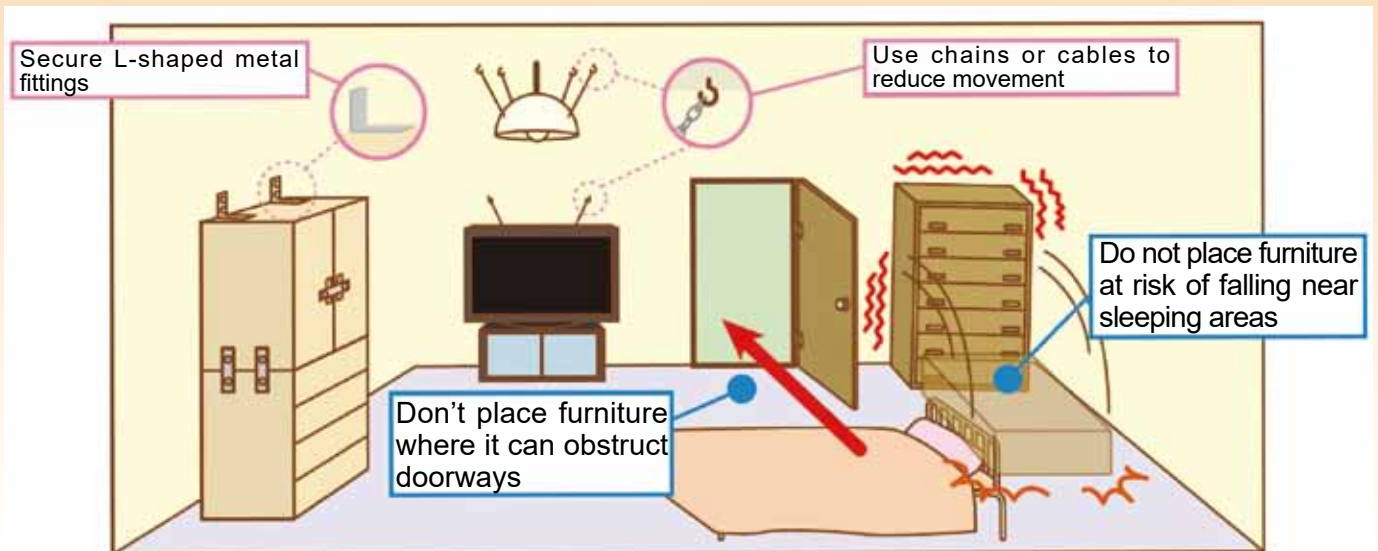
- A program that evaluates earthquake damage risk on wooden homes and offers repair consultations
- A program that offers financial support for needed repairs on wooden homes deemed at-risk of an earthquake

(advanced + simple repairs, earthquake-proof shelter installation)

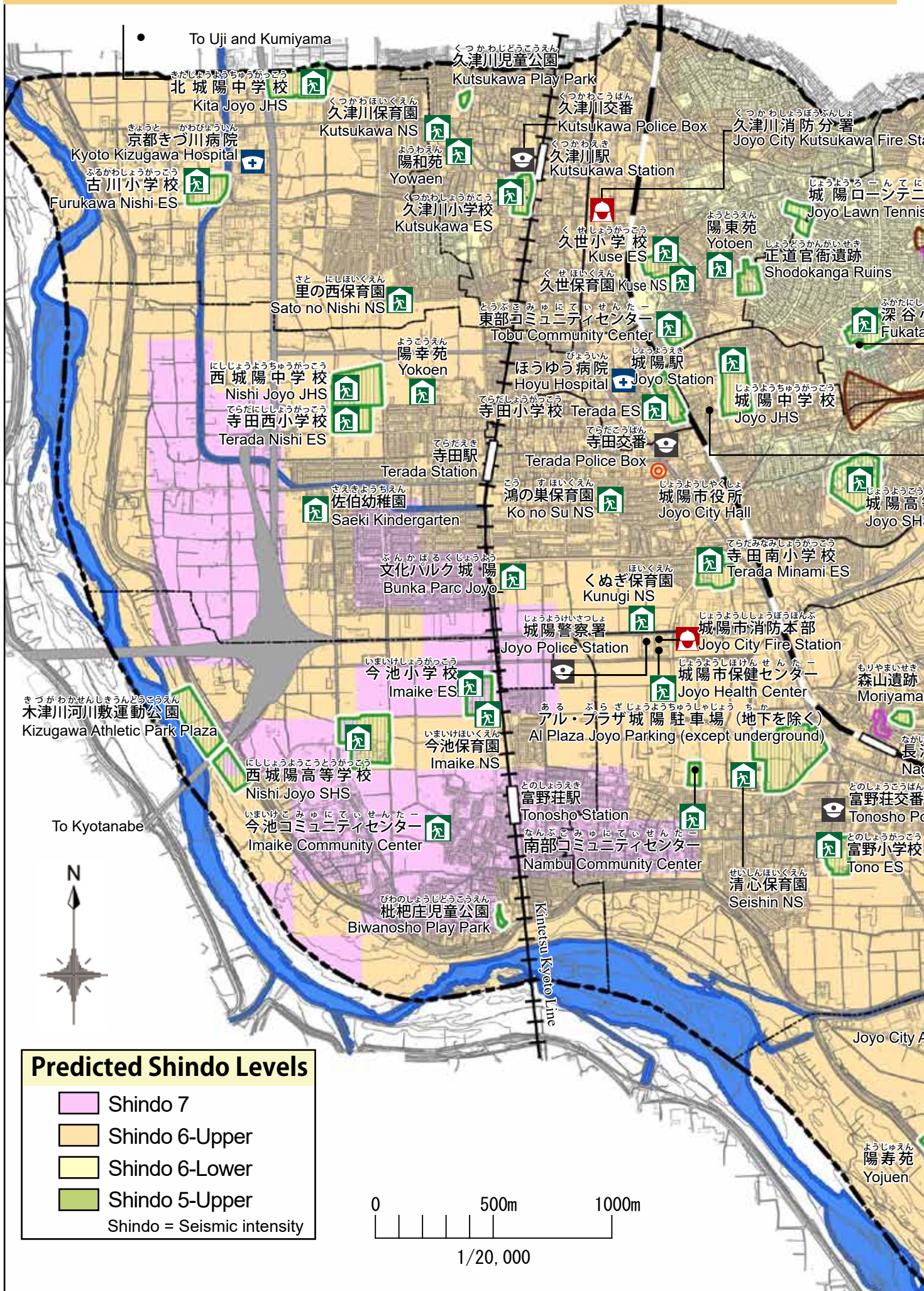
※ wooden houses built before May 31st, 1981 subject to limitations



■ To prevent injury think carefully about furniture placement.

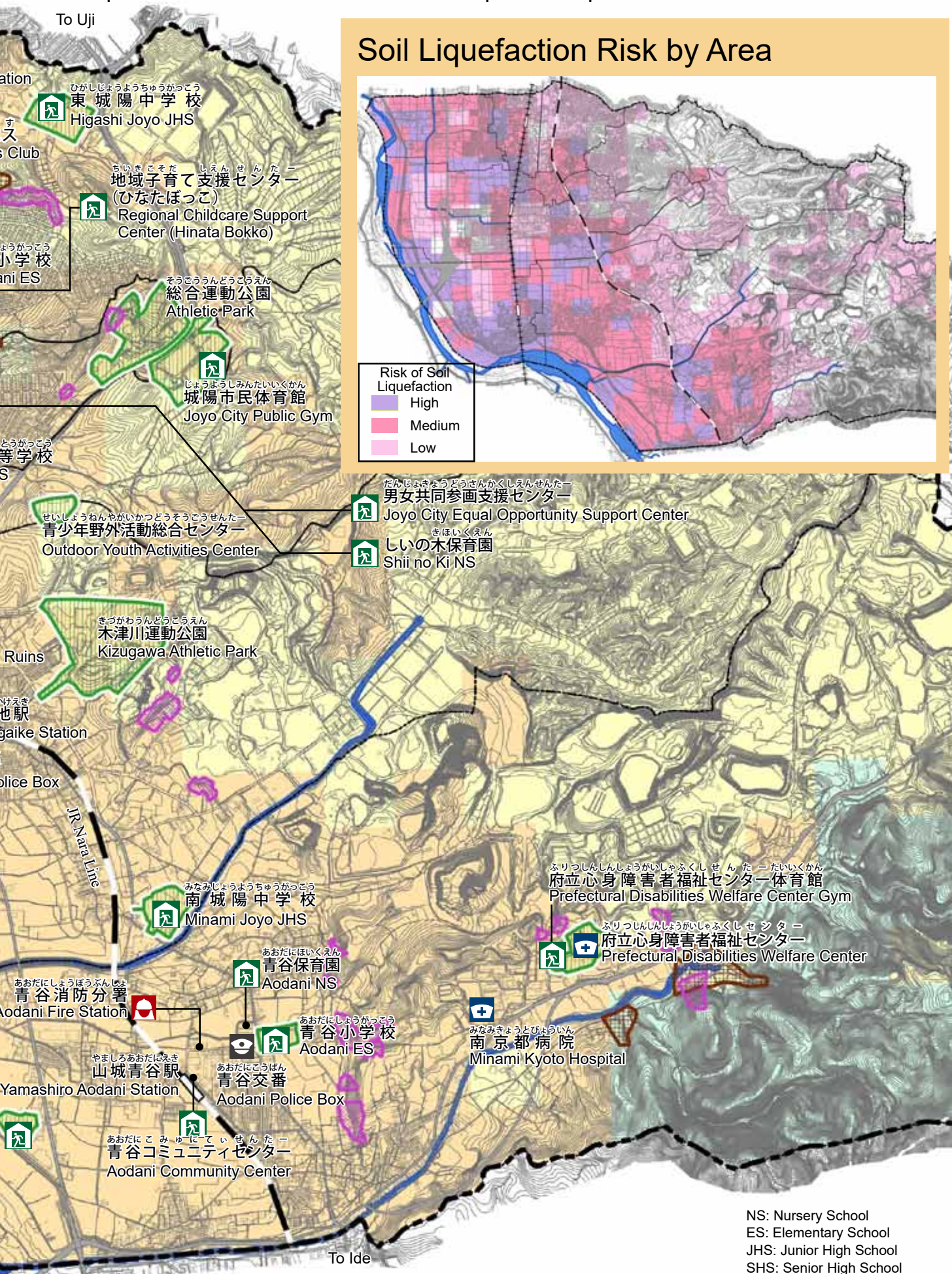


10. Ikoma Fault Zone Earthquake Damage Estimates



Here are estimated Shindo levels and soil liquefaction risk estimates for Joyo from the Ikoma Fault Zone Earthquake.

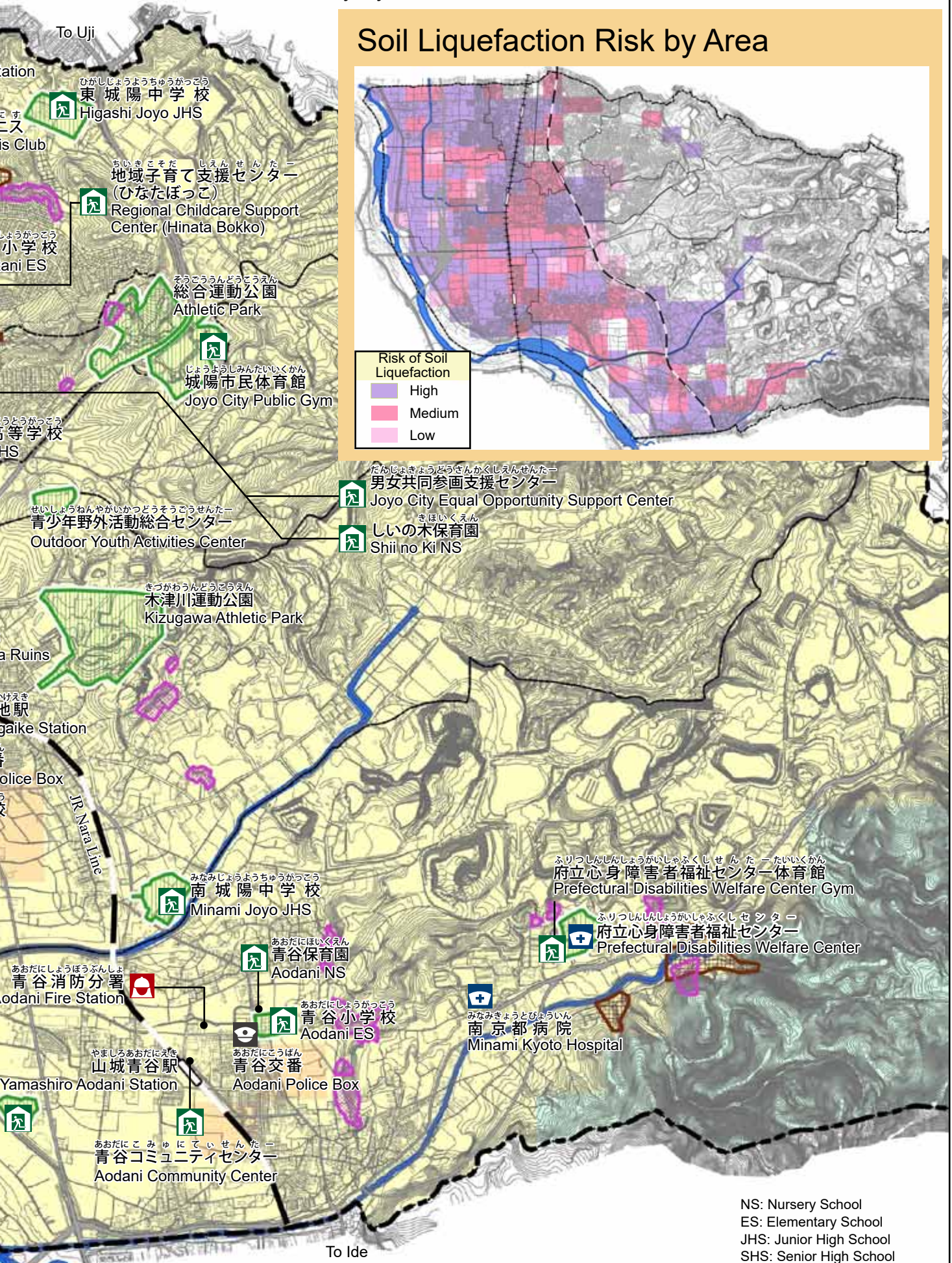
Soil liquefaction: When a solid behaves as a liquid due to pressure



11. Nankai Trough Earthquake Damage Estimates



Here are estimated Shindo levels and soil liquefaction risk estimates from the Nankai Trough Earthquake, a mega-quake predicted to do massive damage to areas along the Pacific Coast between Kanto and Kyusyu.

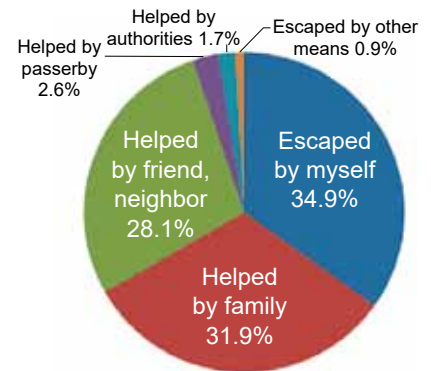


12. Everyday Preparation and Obtaining Disaster Information

90% of the people successful in escaping collapsed buildings during an earthquake were able to do so by their own power or the help of family, friends, or neighbors.

In the event of a large-scale disaster, official help will take time.

During a serious disaster, it is imperative to help yourself and to help and be helped by those in your vicinity.



Read more of "When you were trapped who rescued you?"

Provided by the Cabinet Office of Japan: http://www.bousai.go.jp/kaigirep/hakusho/h26/zuhyo/zuhyo00_02_00.html

● Disaster Preparedness in Your Area

There are volunteer disaster prevention groups within each elementary school district in Joyo. The goal of these groups is for locals to learn how to help themselves and those around them. They organize many evacuation drills and seminars for this purpose. Participation in these groups is important for learning how to use emergency equipment and for becoming independent in the face of a natural disaster.

Volunteer Disaster Prevention Groups in Joyo	
Kutsukawa ES District	Terada Minami ES District
Furukawa ES District	Teradanishi ES District
Kuse ES District	Imaike ES District
Fukatani ES District	Tono ES District
Terada ES District	Aodani ES District



CPR during an emergency drill



Rescuing a person trapped by fallen furniture



Earthquake simulation vehicle



Emergency ration distribution (handing out food to evacuees)

● Preparing Your Emergency Bag

When planning for a large-scale disaster, assume that electricity, gas, water, and communication lines will be unavailable.

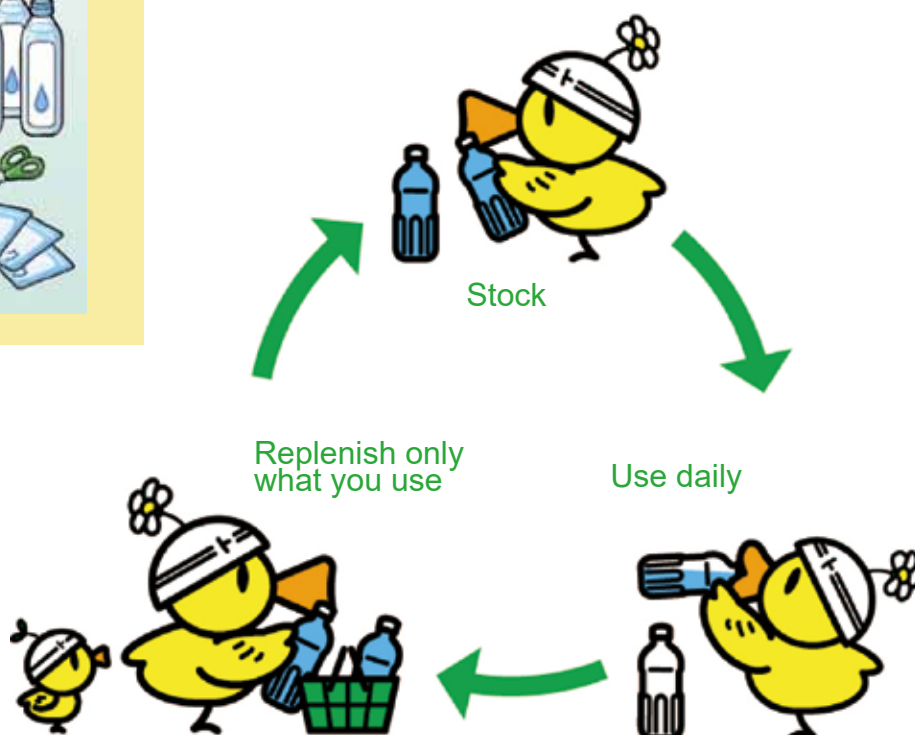
Prepare 3-7 days' worth of food and water ahead of time and put it somewhere easily accessible in the event of a natural disaster.

Category	Item	Checklist
Water & Food	Drinking Water	
	Instant Food	
	Kanpan (canned bread)	
Valuables	Money (include coins)	
	Bank book	
	Personal Stamp	
	Health Insurance Card	
Daily Essentials	ID Card or other piece of identification	
	Flashlight	
	Portable radio	
	Knives, Can Opener	
	Simple Dishware, Spoons	
	Plastic Bags	
	Lighter, Matches	
	Work gloves	
	Vinyl Sheet (Picnic, etc)	
	Marker, Writing Utensils	

Category	Item	Checklist
Emergency Items	Scissors	
	Tweezers	
	Adhesive Bandages	
	Dressing Bandages	
	Antiseptic Ointment	
Sanitary Items	Antiseptics	
	Face Masks	
	Towels	
	Baby Wipes	
Miscellaneous	Toothbrush and Toothpaste	
	Outerwear	
	Innerwear, Socks	
	Shoes	
For infants and elderly	Helmet	
	Disposable Diapers	
	Menstrual Items	
	Powdered Milk, Baby Bottle	



The Rolling Stock Principle



Prepare for a natural disaster by incorporating rolling stock into your daily life.

Rolling stock is the principle of buying a little more than you need and then using and replenishing to ensure a reliable stock of fresh emergency rations.

Provided by JMA: <https://tokusuru-bosai.jp/stock/stock03.html>

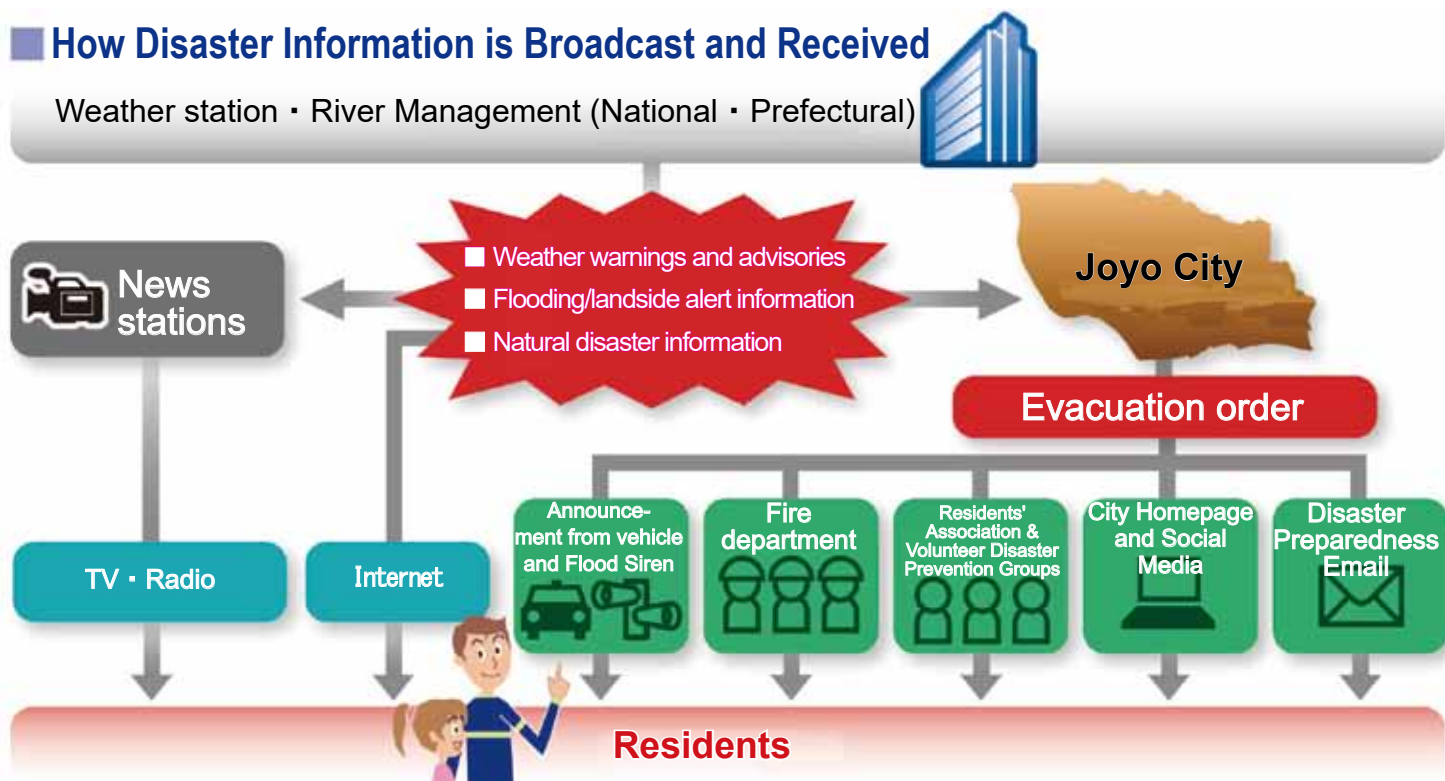
12. Everyday Preparation and Obtaining Disaster Information

● How to Proactively Gather Information about Natural Disasters

When there is a high safety risk due to an earthquake or severe weather, seek accurate, up-to-date information from your city's television, radio, or internet website, and evacuate early.

■ How Disaster Information is Broadcast and Received

Weather station • River Management (National • Prefectural)



"d" Button (Data Broadcasting via TV)

Press the "d" button on your remote control for data broadcasting!



Getting information from the internet

Kyoto Prefecture Crisis Management Website

<http://www.pref.kyoto.jp/kikiweb/>



Safe and Secure Email

Joyo City offers "Safe and Secure Email", a system in which you can receive official information relating to weather alerts, evacuation orders, and more through email. (Japanese Only)



"Safe and
Secure Email"

Getting information from the internet (Multilingual Information)

- **Japan Meteorological Agency (JMA)**
Multilingual Information on Disaster Mitigation
<https://www.jma.go.jp/jma/kokusai/multi.html>
- **NHK World Japan**
<https://www3.nhk.or.jp/nhkworld/>
- **Flood Information from the Ministry of Land, Infrastructure, Transport and Tourism (Japanese only)**
<https://www.river.go.jp/>



JMA

13. Evacuation Sites

● Below is a list of facilities other than community centers, schools, kindergartens and preschools.

Bunka Parc Joyo *

1 Imabori Terada Joyo
General Information: TEL 0774-55- 1010
Planetarium: TEL 0774-55-7667
Playroom: TEL 0774-55-1900



Bunka Parc Joyo is a combined library, planetarium, History and Folklore Museum, and communication center.

An evacuation shelter is a predetermined safe area where people may gather in the event of a flood, earthquake, or other disaster. Please be aware that locations marked with an asterisk (*) are NOT in use for floods.

For more information, see:
https://www.jiea.jp/disaster_prevention_guide.html



Palette Joyo

11-114 Hayashinokuchi Terada Joyo
TEL: 0774-54-7545



Palette JOYO is a facility where men and women can showcase their individuality and work for the health and happiness of the community.

There are 4 elderly welfare centers in Joyo that are used for elderly assisted living and communication centers.

Please note that Yowaen, Yotoen and Yokoen do **not** have parking lots.

Central Elderly Welfare Center
Yojuen*

20 Kawaranokuchi
Nashima Joyo
TEL: 0774-55-1017



Regional Childcare Support Center (Hinata Bokko)

16 Fukatani Terada Joyo
TEL/FAX: 0774-55-9260



Hinata-bokko is a facility for child-rearing support and providing interaction opportunities for all generations in the local community.

Hokubu Elderly Welfare Center
Yowaen*

2 Taishogun Hirakawa
Joyo
TEL: 0774-52-9670



Tobu Elderly Welfare Center
Yotoen

131 Shibagahara Kuse
Joyo
TEL: 0774-53-3700



Outdoor Youth Activities Center

80 Minami-nakashiba
Terada Joyo
TEL: 0774-53-3566

On the gentle slopes of this outdoor facility is an abundance of nature, groves of beautiful trees and a neighboring bamboo forest.



Seibu Elderly Welfare Center
Yokoen*

55 Inuide-kita Terada
Joyo
TEL: 0774-53-9393





Jorin-chan

Contact Information

Crisis and Natural Disaster
Management Section,
Joyo City

〒 610-0195
16・17 Higashinokuchi Terada
Joyo Kyoto
TEL: 0774-56-4045

Japanese Edition March 2018
Additional Language Editions March 2020

* 本冊子は、一般財団法人自治体国際化協会の助成事業により作成しました。

Joyo City Disaster Preparedness Maps for Flooding and Landslides

Special Issue

英語 /English

The four main rivers in Joyo, Kizugawa, Furukawa, Hasegawa, and Aodanigawa as well as their potential flood risk depths are depicted below.

Contact Information

Crisis and Natural Disaster Management Section,
Joyo City

〒 610-0195
16・17 Higashinokuchi Terada Joyo Kyoto
TEL: 0774-56-4045



Inundation depth

- More than 3.0m
- Between 0.5m-3.0m
- Less than 0.5m

- At-risk areas for early flooding
- Designated Evacuation Sites
- Designated Evacuation Site (open space)
- A place where one can evacuate to either after or prior to a natural disaster is called an "evacuation shelter".

- At-risk areas for debris flow (rocks, soil, etc)
- At-risk areas for landslides (collapsing of steep slopes and hills)
- Fire Station
- Police
- Hospital
- City Hall

Establishment of Early Evacuation Zones
Areas within numbers ①~③ (early stage evacuation zones) are believed to present a high safety hazard risk should a flood occur. If you receive an evacuation order for this area, please evacuate immediately.
① Areas where inundation levels exceed more than 1.0m (waist height of an adult)
② Areas where inundation levels exceed 0.5m (knee height of an adult) after more than 24 hours of continuous rain
③ Areas where flood waters are strong enough to sweep away houses and other buildings

NS: Nursery School
ES: Elementary School
JHS: Junior High School
SHS: Senior High School
0 500m 1000m
1/20,000
Published in March 2018

Joyo City Disaster Preparedness Maps for Earthquakes

Special Issue
英語 /English

Ikoma Fault Zone Earthquake Damage Estimates

