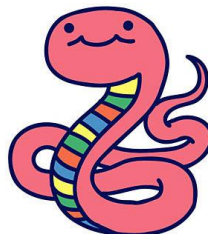


Disaster Manual for International Students

2023 Revised Permanent Edition



March 2024

University of the Ryukyus
Global Education Center
International Student Unit

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0. How to Use This Manual

This booklet tells you what to do when you are confronted by an earthquake, tsunami, or typhoon and how to prepare for these disasters. Reading through this in advance will enable you to calmly and appropriately deal with these emergencies.

The booklet covers only natural disasters that might occur in Okinawa Prefecture. Be aware that this does not include volcanic eruptions, river flooding, underground water damage, etc. in other prefectures.

You can access this booklet from the International Education Center International Student Unit homepage.

Spring 2024
The University of the Ryukyus
Global Education Center
International Student Unit

1. Typhoons

1-1. About typhoons

In Okinawa, July through October is generally called typhoon season, but sometimes it starts as early as May. Typhoons are accompanied by high tides, high waves, and heavy rain, and they can cause big disasters like shore, housing, or road disasters, as well as landslides and floods. They bring dangers like strong winds that sometimes create flying debris and take down signboards and tree limbs, and cars can be overturned.

Since the typhoons that come to Okinawa are often slow moving and frequently remain in the area for an extended period of time, you must be careful.

1-2. Preparing for typhoons

- 1) You can check a typhoon's subsequent movements and the storm zone on the Internet and television.
- 2) When a typhoon hits or passes nearby, the power supply might be cut off due to flying debris damaging or cutting electric lines. In addition, water or gas service might sometimes be cut off. To prepare for such situations, it will be useful if you prepare the following:
 - a) A flashlight
 - b) A portable radio
 - c) Extra batteries
 - d) A fully charged cellphone and personal computer
 - e) A one- or two-day supply of food and drinking water
 - f) Water for daily use (keep some water in the bathtub)
- 3) Because of strong, wind-driven rain, water might come in through windowsills. In such a case, you might stop it by putting newspaper in the windowsills.
- 4) If a window has a ventilation opening, water might get in through it. In that case, you might make it better if you make sure it is completely shut.

1-3. When a typhoon approaches

- 1) Since the rain and wind are very strong, please try to **avoid going out at all if possible.**
The seashore is especially dangerous because of high waves. You need to be very cautious and stay away from the ocean.
- 2) Check for warnings on television, the radio, or the Internet.
 - a) Check whether a **storm warning or a special warning** (**heavy rain special warning, storm special warning, high tide special warning, or surge special warning**) has been issued or not.
If one has been issued, classes will be canceled. (→cf. Reference data 2)
 - b) Also check whether public transportation is operating or not. If bus service is canceled, universities, public institutions like city and town offices, and hospital outpatient reception counters will be closed (except emergency centers).
 - c) Check whether an **evacuation order** has been issued or not in the area where you are.

The way to check for evacuation orders is different in different areas. You will be able to check for them on individual municipal homepages or through area electronic alerts.

Municipal homepages:

Okinawa Disaster Prevention Information Portal *Haisai Bosai Deebiru* All Okinawa:
“Okinawa Prefecture disaster prevention weather report” <http://www.bousai.okinawa.jp/>
English, Chinese (Chinese traditional, simplified Chinese characters), and Korean
versions are available: <http://www.bousai.okinawa.jp/>

In addition, the Meteorological Agency provides the following site.

The Meteorological Agency Multilingual Dictionary of Urgent Earthquake Breaking
News, Tsunami Warnings (English, Chinese (Chinese traditional, simplified Chinese
characters), Korean, Portuguese, Spanish, and easy Japanese)

<http://www.data.jma.go.jp/svd/eqev/data/tagengo/tagengo.html>

Area electronic alert (→cf. 5. Area electronic alert)

NTT Docomo: <https://www.nttdocomo.co.jp/service/safety/areamail/>

Softbank: http://www.softbank.jp/mobile/service/urgent_news/about/disaster_info/

au: <http://www.au.kddi.com/mobile/anti-disaster/kinkyu-sokkuho/>

1-4. Danger of a storm surge

When a typhoon approaches, due to atmospheric conditions or strong wind, ocean
water might come over dikes and flood roads and houses. If you live or work near the
ocean, be alert to [storm surge emergency warnings](#), [storm surge warnings and storm
surge advisories](#). [Since rivers can also overflow their banks due to high tides, you must
be careful not to go too close to the ocean or rivers.](#)

1-5. A Warning or an advisory when a typhoon comes

When a typhoon comes, a warning or an advisory might be issued. Be on the lookout
for them. [An emergency warning means there is serious danger, such as a once in several
decades event.](#) A *warning* means there is a strong possibility of a serious disaster. On the
other hand, an *advisory* means there is the possibility of a disaster.

Emergency warnings	Heavy rain emergency warning	Storm emergency warning
	Storm surge emergency warning	High-wave emergency warning
Warnings	Heavy rain warning	Flood warning
	Storm surge warning	Storm warning
Advisories	Heavy rain advisory	Flood advisory
	Storm surge advisory	Strong wind advisory
Others	Record time heavy rain information ※1	
	Earth or sand disaster warning information ※2	

※1 Record time heavy rain information is a disaster prevention report that will be broadcast when
a heavy rain warning is issued. It means the amount of rainfall has reached a level capable of
creating a disaster in the area issued.

※2 Earth or sand disaster warning information is a disaster prevention report that will be broadcast when a dangerous level of ground saturation has been reached capable of causing cave-ins or landslides.

The chart below shows emergency weather information and appropriate responses. Furthermore, caution level 4 means an evacuation order.

Information from the Meteorological Agency, etc.	Description	Cities', towns', and villages' responses	Residents' action	Caution level
Special heavy rain warning	Urgent disaster [<i>saigaiseppaku</i>]	Shelter in place if unable to evacuate	Life threatening danger! Seek safest place to shelter	5
Landslide disaster, storm surge, or special storm surge warning	Danger [<i>kiken</i>]	Evacuation order	Everyone should evacuate from dangerous places	4
Heavy rain or flood warning or a caution that might lead to a storm surge warning	Be on the alert [<i>keikai</i>]	Evacuation by the elderly and others in need of assistance to do so	The elderly and those with special needs should evacuate from dangerous places	3
A caution that might be changed to a heavy rain warning, a heavy rain or flood alert, or a storm surge advisory	Caution [<i>chuu</i>]		Check your own evacuation plans and preparations	2
Early-warning information			Prepare for disaster	1

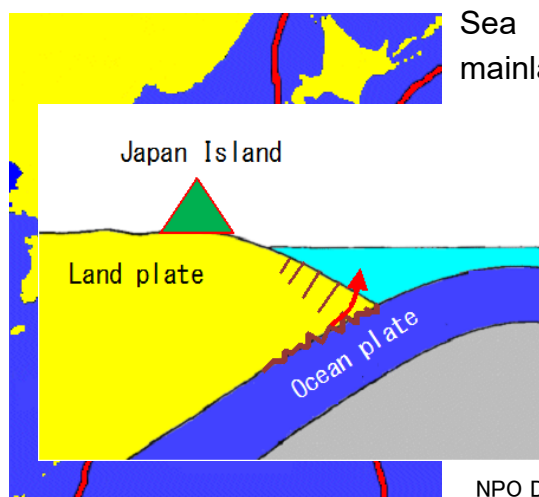
2. Earthquakes

2-1. About earthquakes

The Japanese Islands, located along the boundaries of numerous tectonic plates, have had a lot of big earthquakes in the past. As the illustrations that follow show, on the Pacific side of Japan, plates like the Pacific Plate and the Philippine Plate are sinking under Japan and are scraping against the plates (the North American Plate and the Eurasian Plate) upon which Japan rests. The edges of the top plates, which are being pulled down, gradually store up energy, and when it becomes too great, they will spring back upward. At this moment, an earthquake occurs.

You might hear that there are no earthquakes in Okinawa. One registering 5.0 struck the Okinawa mainland in 1911 because of an earthquake that occurred in Kikai-jima, and after that there was one registering 5.0 that struck the Okinawa mainland in 2010. Therefore, there is no scientific reason to believe that there will not be another strong earthquake here.

To the east of the Okinawan islands, the Philippine Sea Plate is sinking below the Eurasian Plate, upon which the Okinawan islands are located. In such a location, there is a possibility that a strong trench type earthquake will occur, and in that case, a giant tsunami wave will likely be generated. It might occur at the boundary of the Philippine



Sea Plate, which is located under the Okinawa mainland or on the land side of the Eurasian Plate.

NPO Disaster Damage Prevention NPO Miraikai

<http://www5d.biglobe.ne.jp/~miraikai/nihonnopureito.htm>_____

A partially modified illustration of the plates near the Japan Islands

Professor Mamoru Nakamura, from the science department of the University of the Ryukyus, pointed out that if a big earthquake occurs in Okinawa, since the earthquake-resistant standards in Okinawa Prefecture are the lowest in Japan, severe damage will result for buildings built on pilings without quakeproofing and buildings that were built before 1981. (*If an Earthquake Occurs in Okinawa:*

<http://seis.sci.u-ryukyu.ac.jp/hazard/large-eq/higaiyosoku.html>)

2-2. The size of an earthquake: magnitude and seismic intensity

Magnitude indicates the amount of an earthquake's energy, while seismic intensity indicates the amount of shaking in each place. The equivalence chart between seismic intensity, which is announced by the Japanese Meteorological Agency, and the level of

shaking that people feel is as follows:

	Seismic intensity 0	People do not feel it.
	Seismic intensity 1	A few people inside houses might feel a slight shaking.
	Seismic intensity 2	Many people inside houses feel shaking. Some sleeping people will be awakened.
	Seismic intensity 3	Most people in houses will feel shaking. Some people will be afraid.
	Seismic intensity 4	The sensation of fear will be strong, and some people will try to protect themselves. Most sleeping people will be awakened.
	Seismic intensity weak 5	Many people will try to protect themselves. Some people's actions will be impeded.
	Seismic intensity strong 5	People will feel strong fear. People's actions will be impeded.
	Seismic intensity weak 6	It will become hard to stand.
	Seismic intensity strong 6	People will not be able to stand still and cannot move without crawling.
	Seismic intensity 7	People will be tossed about by the shaking and be unable to control their own actions.

<http://www.jma.go.jp/jma/kishou/known/shindo/shindokai.html>

From seismic intensity and shaking circumstances (outline)

2-3. Preparing for earthquakes

An earthquake may occur suddenly someday. In order to be able to act calmly at that time, please prepare for it.

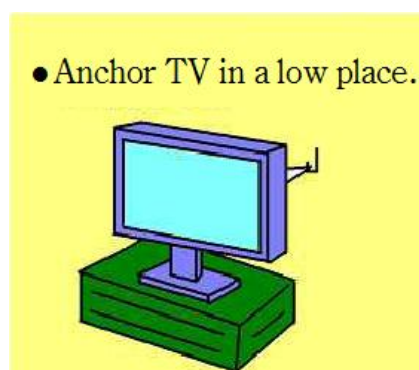
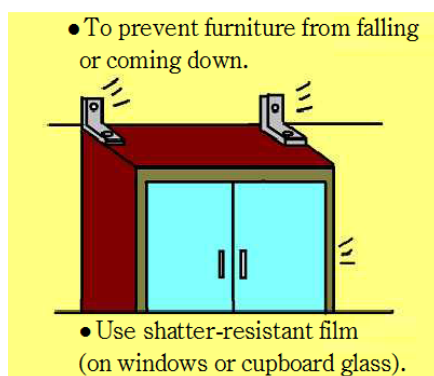
- 1) To prevent furniture or electrical appliances from falling on you when you are sleeping, keep them in safe places (put them as close to the floor as you can). Also, do not put things that might block your escape near entrances.

Check!!

☑ Check!

① Is furniture secured so it will not fall down?	
② Will glasses and dishes be prevented from falling and shattering?	
③ Are electrical appliances (e.g., computer) secured to not fall?	
④ Are entrances free from possible obstructions?	

※You can buy adhesive rubber pads that are a tip-over safety device for furniture and shatter-resistant film for glass at a home center.



From Ginowan City handbook for times of emergency

http://www.city.ginowan.okinawa.jp/DAT/LIB/WEB/1/bousaitetyou_tuujyou.pdf

2) Prepare a *hijo bukuro*, an emergency bag.

In order to evacuate immediately, keep these necessities in a travel bag.

- | | |
|-------------------------------|---|
| ① a flashlight | ⑦ a pair of gloves (cotton work gloves) |
| ② batteries (for replacement) | ⑧ a helmet |
| ③ a portable radio | ⑨ a packet of wet tissues |
| ④ a cloth | ⑩ a plastic bag |
| ⑤ a towel | ⑪ cash (small bills and change) |
| ⑥ a mask | |

※Since *hijou bukuro*, emergency bags, are available at home centers in Okinawa, it would be a good idea to buy one.

3) Prepare emergency supplies. A standard amount is for about three days.

- ① drinking water
- ② food like biscuits that can keep for a long time and be eaten without cooking
- ③ powdered milk and disposable diapers if you have a baby

4) Electricity might be cut off due to an earthquake. To prepare for a nighttime earthquake, keep a flashlight, extra batteries, and a radio near your bedside. In addition, make sure your cellphone, smartphone, tablet, or personal computer is charged.

- 5) Because of a falling cupboard and breaking glass, pieces of glass might be scattered inside the house. To prevent injury to your feet, keep a pair of slippers or shoes by your bedside.
- 6) Plan how to contact your family in emergency.
There are some emergency contact service sites like NTT Saigai Dengon Dial 171 (disaster message dial 171) and cellphone Saigai-yo Dengon-ban (message board for disasters). Please check how to use them.

2-4. When an earthquake occurs

- 1) If you are inside a building (at home, in an office, a classroom, etc.), furniture, appliances, bookshelves, or cabinets might topple over. There is also a danger that books on bookshelves or dishes in cupboards might fall. Hide under a table or a desk and wait until the quaking stops.



- 2) If you are using gas, turn it off if possible!
※A spilled pot might severely injure you. As it is very dangerous, if a quake is strong, move away from the stove quickly, and turn off the gas when the quake has stopped.
- 3) If you are in a supermarket
- Shelves might topple over or goods might be falling from the shelves. Cover your head with a bag or something, and move away from the shelves immediately.
 - Follow the instructions of the person in charge.
- 4) If you are inside an elevator
- Newer elevators have an earthquake sensor and will stop automatically near a floor. Stay calm and get off the elevator on that floor. If the elevator does not have an earthquake sensor, push all the floor buttons and get off wherever it stops.
 - If you are stuck inside an elevator, push the emergency button, the *hijou-yo yobidashi* button, to contact help and follow the instructions of the person in charge.

- 5) If you are outside (on campus or in town)

- If you are walking near a building, it is possible that glass windows, signs, walls, or outdoor air conditioner units will fall. Protect your head with a bag or something and move away from the building.
- Since a concrete block wall might fall, move away immediately.



- 6) If you are driving a car, **no sudden braking!**

Slow down gradually, stop your car along the left shoulder of the road, and stop the engine.

- 7) If you are on a bus or the monorail

- If you are sitting on a seat, lean forward and protect your head with a bag or something if possible.
- If you are standing, hold on to a handrail or a strap tightly.
- Follow the instructions of the person in charge.

2-5. When an earthquake stops → When you need to evacuate

1) If you are inside a building (at home, in an office, a classroom, etc.)

- a) Make sure all flames, such as stove burners, are extinguished.
- b) Wear shoes.
- c) Confirm emergency information on the television or radio.

Okinawa Prefecture disaster damage prevention information and weather access from cellphones/smartphones: <http://www.bousai.okinawa.jp/sp/>

↓ If you have to evacuate ... **do not evacuate by car!**

- d) Evacuate with an emergency bag. Do not forget your passport, residency card, and student ID.
- e) In order to prevent fires, close the gas main tap and shut down the electricity circuit breaker.

2) If you are near the ocean

A tsunami might hit you; **leave the area immediately and evacuate to high ground or a high building.**

(→ See 3. Tsunami in detail)

Caution: On Miyako Island and Ishigaki Island, there are signs that a tsunami rose 40 meters above sea level, so you have to evacuate high enough from the ocean level.

3) If you are driving a car ... **do not evacuate by car!**

Confirm emergency information with the car radio.

Okinawa prefecture disaster damage prevention information and weather access from cellphones/smartphones: <http://www.bousai.okinawa.jp/sp/>

↓ If you have to evacuate:

- a) Leave the car without locking the door and leave the engine key in the car.
- b) Remember to bring all important things with you.
- c) Evacuate carefully so as not to be hit by another car.

2-6. If a fire occurs because of an earthquake

Even if a fire starts, if there are no synthetic materials around to burn, it might not spread rapidly, so be calm and try to put the fire out with a fire extinguisher or water.

- 1) In a loud voice, let the neighbors know about the fire.
- 2) Attempt to put out the fire with a fire extinguisher or water before the fire reaches the ceiling.
- 3) If the fire reaches the ceiling, get out and call **119**.



2-7. Earthquake early warnings

The Earthquake Early Warning system provides an advance announcement of estimated seismic intensities just after an earthquake occurs. These are not earthquake predictions! Since August 30, 2013, an earthquake early warning for a quake stronger than a weak 5 has become “an early emergency warning.”

Earthquake scale	Type of warning	Type of prompt
More than 6-weak	Emergency warning	Urgent earthquake prompt (Warning)
More than 5-weak	Warning	
More than 3 or magnitude of 3.5	Forecast	Urgent earthquake prompt (Forecast)

From Meteorological Agency emergency warning announcement standards:

<http://www.jma.go.jp/jma/kishou/known/tokubetsu-keiho/kizyun.html>

The above information will be available in the following ways:

a) On a cellphone

NTT docomo, Softbank, and au distribute earthquake early warnings. Make sure whether your cellphone can receive them or not. Check how to set yours up for receiving them.

NTT docomo https://www.nttdocomo.co.jp/service/safety/areamail/earthquake_warning

Softbank http://www.softbank.jp/mobile/service/urgent_news/about/disaster_info/

au <http://www.au.kddi.com/mobile/anti-disaster/kinkyu-sokuho/>

b) From TV or radio

First, you will hear the sound of a chime, and a visual and oral broadcast. As commercial radio and TV stations use the same chime sound as NHK uses, try to learn the NHK chime sound to recognize the warning sound immediately.

NHK chime sound <http://www.nhk.or.jp/sonae/bousai/>

c) From disaster prevention administration radio

After October 1st, 2007, disaster prevention administration radio using the all Japan instant warning system, J-ALERT, is provided in municipalities. Check whether this system is provided in your town.

※For more information about Earthquake Early Warnings, see the following home pages.

The Meteorological Agency, Earthquake Early Warnings

<http://www.data.jma.go.jp/svd/eeew/data/nc/koudou/koudou.html>

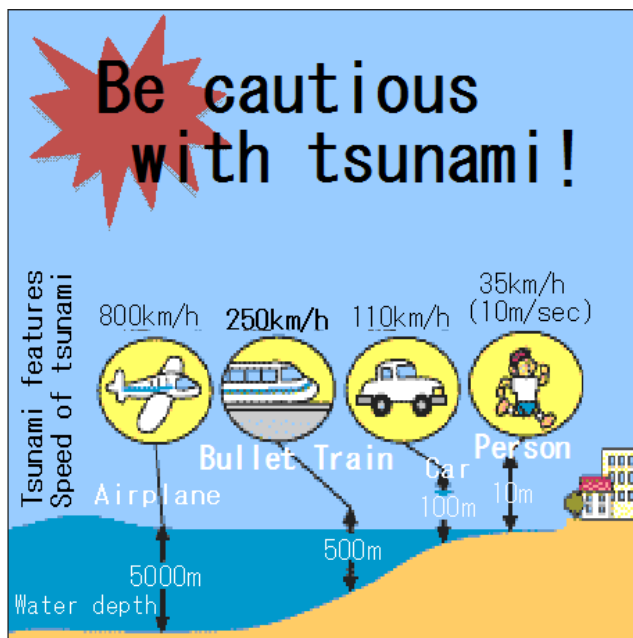
3. Tsunami

3-1. About tsunami

When an earthquake occurs on the ocean floor, the movement of the ocean floor can produce a tsunami. A tsunami that is created like this can come as fast as a jet across the deep ocean. Even near shore, a tsunami that has reached shore can sometimes travel faster than 36 km/h (10m/sec.).

Excerpt from: *Asahi Gakusei Shimbunsha*
Junior Asahi—Japan Is an Earthquake Country

For information about the propagation velocity of tsunami and ocean depth, visit this website:



http://www.asagaku.com/kokoku/jishin_tsunami/nihonwajisintaikoku.html

As a tsunami reaches shallow water and hits land, its height will increase to an altitude of 2-3 times the height observed off the coast. For example, a 5-meter high tsunami offshore can rise to 10 meters high when it reaches land. The relationship between the height of a tsunami and the damage caused is explained below:

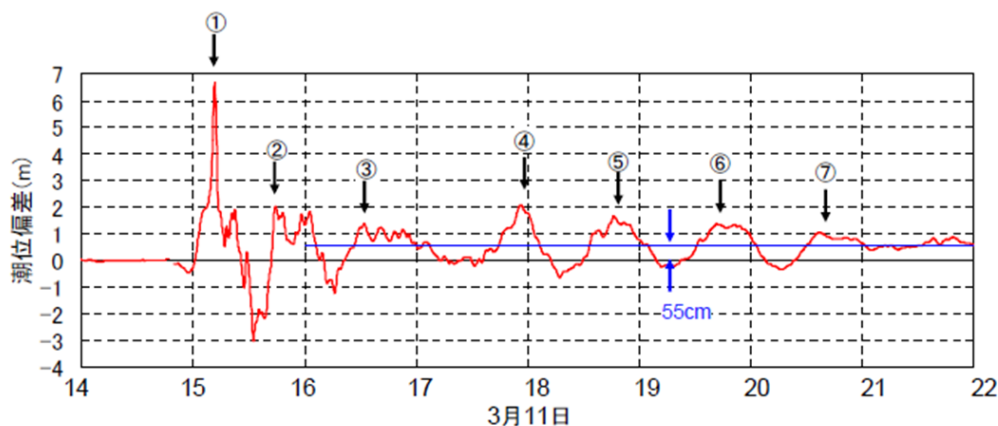
The height of a tsunami and damage:

Height of tsunami	Estimated damage and recommended action
0.2m~1m	Swimmers will be carried out to sea, aquaculture fixtures will be carried away, and small ships will be capsized. → Get out of water immediately and leave the seacoast.
1m~3m	There is danger of flood damage in low-lying areas. Anyone near the sea in a place without a breakwater will be dragged into the ocean. → Anyone on the seacoast or near a river should evacuate to a safe place like high ground or an evacuation area immediately.
3m~	Wooden houses will be totally destroyed and washed away. People will be washed away in the tsunami surge. → Anyone on the seacoast or near a river should evacuate to a safe place like high ground or an evacuation area immediately.

From Meteorological Agency tsunami warning advisory * tsunami information * tsunami prediction:

3-1-1. Features of tsunami

- 1) Tsunami **can strike repeatedly**. (There is a threat of additional waves for a few hours after the first tsunami arrives.)
- 2) The first wave is not always the biggest one.
- 3) A tsunami does not always start with a backwash.
- 4) Even just a knee-high tsunami can easily carry people away.
- 5) When the tsunami has a backwash, it has a strong current dragging things offshore.
- 6) A tsunami **can reach far inland**, not necessarily across land but rather up rivers or waterways.
- 7) **The projected arrival time and height of a tsunami are different** based on its birthplace and the size of the earthquake.



Waveform of a tsunami on GPS offshore south of Iwate Prefecture on March 11, 2011

(Extract from documents by Harbor and Airport Technical Research Institute)

After the first wave arrived, tsunami repeatedly struck within a cycle of 50 minutes. It was actually six hours after the first wave arrived that the tsunami died down.

3-2. Tsunami prediction

If an earthquake occurs and a tsunami is forecast, **within three minutes after the earthquake, the Meteorological Agency** will announce a tsunami prediction with a warning or alarm, announcing the tsunami's predicted arrival time and strength. In the case of a huge earthquake such as over magnitude 8, it is not possible to announce with high precision the magnitude of the earthquake immediately. Therefore, the announcement of its magnitude will be made in two steps. Its height will be announced as *kyodai*, huge, or *takai*, high; after that, numbers will be announced. In a very hazardous situation, such as a once-every-few-decades event, *tokubetsu keiho*, an emergency warning, will be issued.

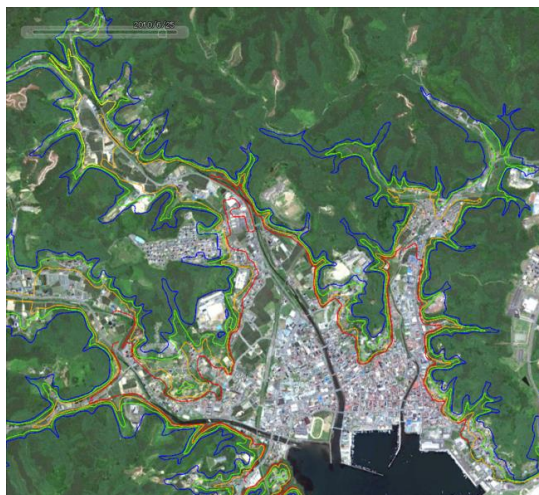
Types of tsunami warnings and advisories

	Report criterion	Description of huge earthquake	Issued by numbers
Major tsunami warning (Emergency warning)	More than 3-meter-high tsunami	Huge (<i>kyodai</i>)	5m, 10m, more than 10m
Tsunami warning	More than 1m but less than 3m	High (<i>takai</i>)	3m
Tsunami advisory	More than 0.2m but less than 1m with a possibility of tsunami damage	(none)	1m

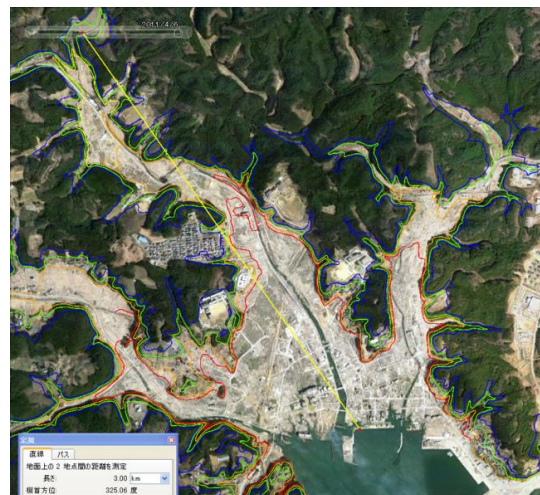
From Meteorological Agency tsunami warning advisory * tsunami information * tsunami prediction:

<http://www.data.jma.go.jp/svd/eqev/data/joho/tsunamiinfo.html>

3-3. Saving lives by evacuation



Before the disaster



After the disaster

Damage caused in the East Japan Disaster on March 11, 2011

(Minami Sanriku-cho, Miyagi Prefecture, Google Earth pictures; the red lines show 5 meters above sea level) From the coastline to 3km inland and over 20m altitude, all man-made structures were washed away by the tsunami.

Comparing these two pictures, you can see that most of the buildings in the area under 20 meters above sea level were destroyed by the tsunami. The best way to protect your life is to evacuate to high ground. Northeast Japan has been hit by a big tsunami that reached over 40 meters above sea level a few times in the past.

The Okinawa area has suffered big earthquakes in the past. A clear record remains of the damage caused by the Showa Major Tsunami in 1771; about ten thousand people lost their lives. It was reported that the tsunami at that time reached 40 meters high. That

is to say, the highest-level tsunami in the world has occurred in Okinawa.

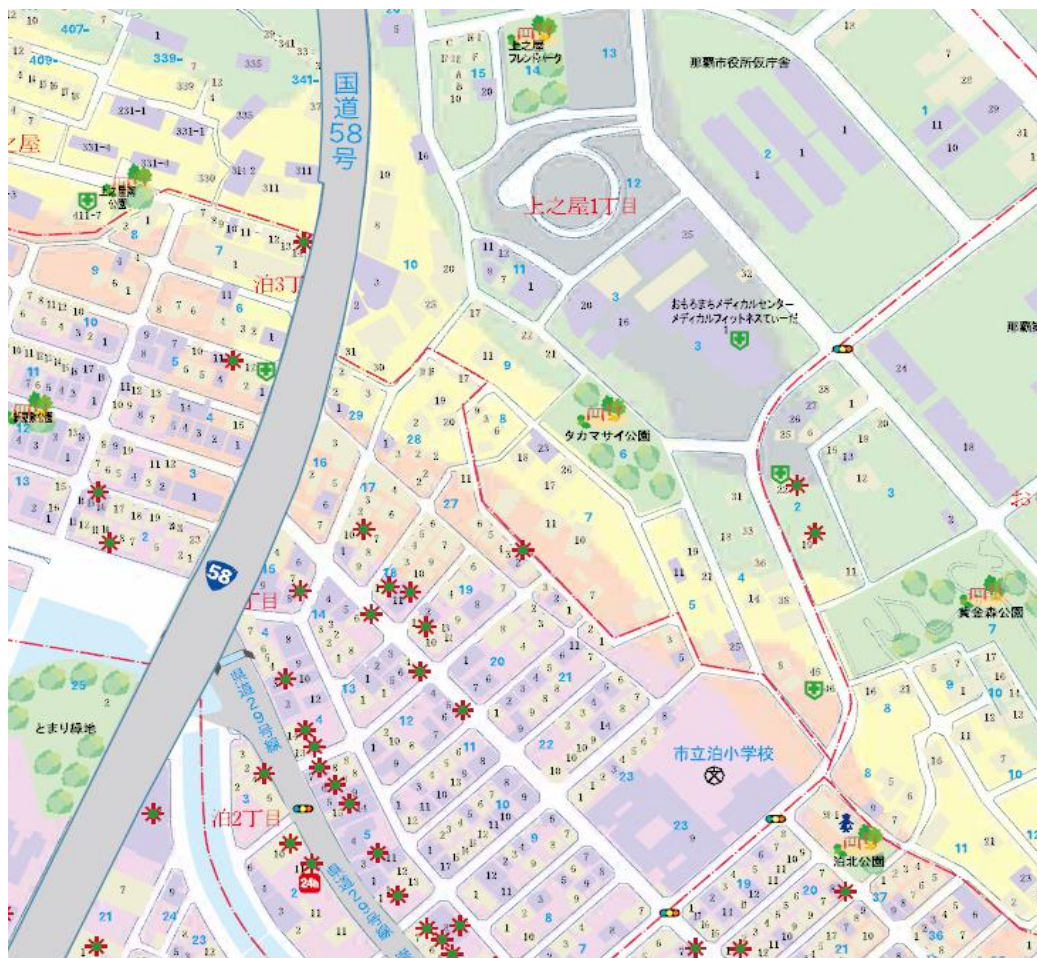
There is a lot of evidence that shows there were major tsunamis in Okinawa in the past. One piece is the picture below. Many of the rocks that dot the picture are called *tsunami ishi* (tsunami boulders), or tsunami rocks. It is estimated that coral rocks from the sea on the left of the picture were moved over the land and into the sea on the right side. As the height of the land is 15 meters above sea level, it means that rocks weighing more than dozens of tons were thrown as high as the roof of a five-story building. This tells the fearsome power of a tsunami.



Tsunami-stones that are scattered in Higashi Hennasaki on Miyako Island

(It is believed that a tsunami carried the rocks from the sea to the left across the land to the sea on the right. You can judge the size of the rocks compared to the height of the people in the photo. The land height is 15 meters above sea level.)

3-4. Confirm an evacuation route



An example of confirming an evacuation route using the disaster reduction map that has height above sea level and addresses. (From the super disaster reduction map by Prof. Nakaza, University of the Ryukyus and the Life Map Company cooperative project)

After the East Japan Disaster, each area in Okinawa has indicated its **altitude above sea level**. Checking the altitude of the area in which you live is recommended. It is absolutely necessary to know the **altitude above sea level** in advance in order to evacuate precisely. (→It is possible to check the altitude above sea level by yourself. To know how to check sea level altitude, refer to 3-5, preliminary information to prepare for a tsunami, 3) Mapion map and all-Okinawa elevation map.) The map above is an example of a **disaster reduction map**, which shows altitude above sea level in different colors. It is very important to check in advance the route by which you can evacuate immediately by using such a disaster reduction map.

During the Sumatra offshore earthquake tsunami in 2004 and the Samoa offshore earthquake tsunami in 2009, so many people lost their lives because they tried to escape too late. In the East Japan Earthquake tsunami, there was a sharp difference between those people who had drilled their evacuation route and escaped successfully and those who didn't. Being able to evacuate successfully is the primary concern, and for that purpose, it is very important to check in advance.

In an evacuation, evacuating to a high place more than 40 meters above sea level is the best way, but if there is no place high enough to which you can evacuate, finding a high building is your next best option. Nevertheless, some buildings are built on pilings, and they are weak against earthquakes because some do not have an aseismic structure. It is necessary to check these points in advance.

3-5. Preliminary information to prepare for a tsunami

1) Confirm whether the town where you live is in a tsunami danger area or not.

Okinawa prefecture tsunami flood estimation (March 2017) • Tsunami flood estimation map

http://www.pref.okinawa.lg.jp/site/doboku/kaibo/h27tsunami/h27tsunami_b.html

2) Check evacuation places in the town where you live now on its homepage.

※For example, the mark to the right indicates an evacuation site in Ginowan City.

(From *Notebook on Disaster Damage Prevention* on Ginowan City's homepage

http://www.city.ginowan.okinawa.jp/DAT/LIB/WEB/1/bousaitetyou_tuujiyou.pdf).



3) **Check the height above sea level** of the area where you live.

Sites where you can check height above sea level are:

Mapion map (after the destination map appears, right click the mouse):

<http://www.mapion.co.jp>

Okinawa Prefectural Police All-Okinawa elevation map

<http://www.police.pref.okinawa.jp/docs/2015042100012/>

※The Okinawa Prefecture Earthquake and Tsunami Assumption Consideration Committee, which was inaugurated after the East Japan Disaster, set the lowest tsunami flood line at five meters above sea level. Incidentally, the area around the University of the Ryukyus' Senbaru

campus is located 126 meters above sea level, and the area around the Nishihara Town office is five meters above sea level.

✳After the East Japan Disaster, height above sea level indicators have set up at public buildings or on electric poles, as shown, as a tsunami protection measure. Check for them when you go out. For example, Nakagusuku Village set up noticeboards like below.



Less than 5m is indicated in red, from 6-19m in yellow, and over 20m in blue.

From Nakagusuku Village homepage. Emergency disaster sea-level posters displayed

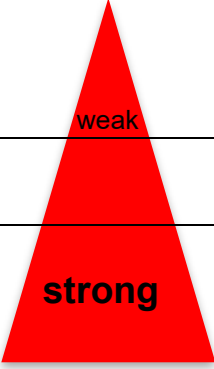
<http://www.vill.nakagusuku.okinawa.jp/menuIndex.jsp?id=53415&menuid=11674&funcid=28>

3-6. When a tsunami occurs: If a big earthquake occurs outside of Okinawa

If a big earthquake occurs outside of Okinawa, including overseas, and a tsunami arises, the Meteorological Agency will issue a [tsunami warning](#) or a [tsunami advisory](#), so make sure that you check the estimated arrival time of the tsunami and its estimated height. Along with this warning or advisory, cities, towns, or villages may issue their own [evacuation warning](#) or [advisory](#). If a [warning to evacuate](#) is issued for the area in which you live, follow their advice.

If the earthquake that caused the advisory is outside of the prefecture, it will take time for the tsunami to arrive here, so take action calmly.

The difference between an evacuation warning and an evacuation advisory

Classification	Binding	
Information to prepare for evacuation		Depending on how things develop, either an evacuation advisory or an evacuation warning may be forthcoming, so this is to warn people to start preparing for evacuation.
Evacuation advisory		This recommends and urges that residents evacuate. (It does not force them to evacuate.)
Evacuation warning		When the danger of damage becomes critical, this will be issued. It is more binding than an evacuation advisory, but residents who do not obey the order will not be legally punished.

From Shimonoseki City Fire Brigade: <http://www.svfc.jp/blog110907150222.html>

3-7. When a tsunami occurs: If a big earthquake occurs in Okinawa

According to the strength of possible earthquakes under the ocean near Okinawa, the Okinawa Prefecture Shore Disaster Prevention Department has made predictions about how big a tsunami will come and has made this information available to the public. How long it will take from the time the earthquake occurs until a tsunami arrives onshore

in Okinawa is predicted. Check the tsunami flood estimation map given below, and know approximately how many minutes it will take for a tsunami to arrive where you live or where you often go after a tsunami occurs, and also how big it might be. (※Caution: This is only a guide.)

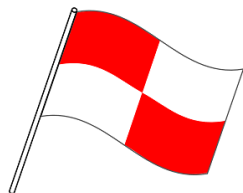
Okinawa Prefecture tsunami flood estimation (March 2017) • Tsunami flood estimation map

http://www.pref.okinawa.lg.jp/site/doboku/kaibo/h27tsunami/h27tsunami_b.html

1) If you are near the coast:

As soon as the earthquake stops, **leave the coast immediately without waiting for an earthquake warning or advisory. Evacuate to high enough ground or a high building as far as possible away from the water.**

Since 2020, if a *tsunami* advisory or *tsunami* warning has been issued, a **tsunami-flag**, shown below, will be put up near the ocean. If you see this flag, get away from the ocean immediately and flee to safety on high ground or a tall building.



From the Meteorological Agency: *Tsunami-flag*

https://www.data.jma.go.jp/svd/eqev/data/tsunami_bosai/tsunami_bosai_p2.html

2) If you are away from the coast but in a low place:

Since tsunami waves are very long, even if you are away from the ocean, it is not safe enough. For example, in the case of the East Japan Earthquake, there were places where the tsunami went six kilometers over land and 12 kilometers in places along a river. **If you are in a low place, five meters above sea level or less, go as far as possible away and evacuate to high ground or a high building.**

※In Urasoe City, look for signs that show a “tsunami evacuation building.” Before the East Japan Earthquake occurred, a good evacuation building was considered to be higher than three stories, but after the disaster, a **five-story one is now considered suitable.**



From Urasoe City Industrial Promotion Center *Yuinomachi* homepage: Tsunami Evacuation building signs posted

<http://yuinomachi.jp/?p=15125>

3) If you are somewhere other than the places mentioned above:

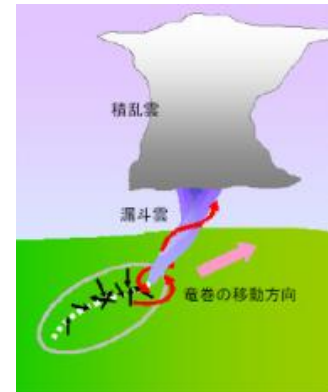
Five meters above sea level is the **minimum** safe level that the Okinawa Prefecture Earthquake and Tsunami Assumption Examination Committee has set for tsunami flooding. If an occasion arises to do so, the Meteorological Agency **will issue a tsunami warning or advisory within three minutes** after an earthquake occurs. If you feel a big earthquake, check for information on the radio or TV immediately. **If a warning has been issued for where you are, evacuate immediately.**

4. Tornadoes

4-1. About tornadoes

A tornado is a violent spiral storm that is generated from a developed cumulonimbus cloud and accompanied by a funnel-shaped or column-shaped cloud. In a short time, it can damage an area from several tens to several hundreds of meters wide and several kilometers long, with concentration.

Although tornadoes can be generated anywhere in Japan, past confirmed production data show that most tornadoes have occurred along coasts in September.



From "Varieties of main gusts" by the Meteorological Agency

From <http://www.jma.go.jp/jma/kishou/known/toppuu/tornado1-1.html>

4-2. If a tornado occurs

When a tornado is approaching, these features are seen:

- 1) A funnel-shaped cloud extends from the bottom of a cloud to the ground.
- 2) Objects fly up into the air in the funnel.
- 3) A rumbling sound is heard.
- 4) There is unusual pressure in the ears because of changing air pressure.

If this happens, take action to protect yourself.

1. If you are outside:
 - a) Go behind a strong building, crouch behind something, and cover your head.
 - b) Since there is a danger of falling debris, stay away from telephone poles and trees.
 - c) As there is a danger of collapse, do not enter garages or sheds.
2. If you were inside:
 - a) Shut windows and curtains, and stay away from windows (glass windows might break).
 - b) If possible, move to a room that has no windows, and hide under a hard desk or table.

The Meteorological Agency leaflet "Protect yourself from tornadoes":

<http://www.jma.go.jp/jma/kishou/books/tatsumaki/index.html>

4-3. Tornado warning information

When there is severe weather that is likely to generate a tornado, the Meteorological Agency will announce tornado warning information. In addition to tornado warnings, warnings will be given for down bursts, intense gusts of descending air flowing down from a cumulonimbus cloud to the earth's surface, and gust fronts, gusts made by the movement of cold air under a cumulonimbus cloud to warmer air. After such a warning, you need to be alert for the next hour.

5. Area electronic alert

5-1. What is an area electronic alert?

An area electronic alert sends an early earthquake warning or tsunami warning that has been announced by the Japan Meteorological Agency, or disaster information or evacuation information from Japanese or local public authorities, **to users in a specific area free of charge on their cellphone**. Since it is not affected by congestion on the line, you will be able to receive urgent information promptly.

This is limited to inside Japan. Subscription is not required, but some models require set-up in advance. See the appropriate homepage to check whether your mobile phone is ready to receive area electronic alerts or not.

NTT docomo <https://www.docomo.ne.jp/service/areamail/>

Softbank https://www.softbank.jp/mobile/service/urgent_news/

au <https://www.au.com/mobile/anti-disaster/kinkyu-sokuho/>

5-2. Electronic-alert messages

The following is an example of an area electronic-alert message from NTT docomo. When a phone receives an urgent message, you will hear a dedicated ringtone, and an earthquake early warning, a tsunami warning, or disaster evacuation information will pop up on the screen; after that, they will be saved in your “received messages” box. **Whether you hear a ringtone or not while your phone is in “manners” mode or in “normal” mode depends on the model you have.** Please check for information on your mobile phone through your service provider’s homepage.



津波警報

From <https://www.docomo.ne.jp/service/areamail/>

6. Other dangers

There are other things that you have to be careful about when you live in Okinawa besides natural disasters.

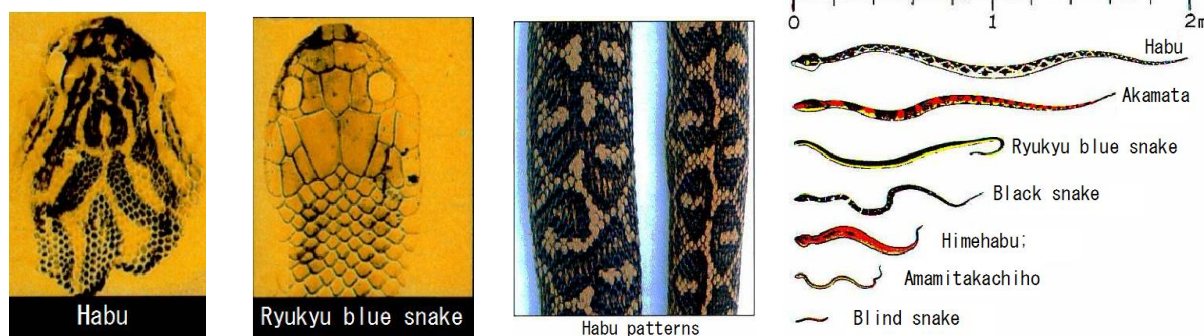
6-1. Beware of *habu* snakes

There are deadly poisonous snakes in Okinawa. They are called *habu*. *Habu* snakes live in the woods and the grass. Since they are nocturnal in their habits, they start moving after it gets dark. They will be especially active in high humidity and on warm nights. During the winter, they move slowly, but they do not hibernate.

Be careful, even in the daytime, for they might be in shady places like in the grass, in a tree, or in the woods.

6-1-1. How to distinguish *habu* snakes

The head and body of *habu* snakes are covered with fine scales while other kinds of snakes are covered with big scales. They can also become very long, sometimes more than two meters.



Okinawa Prefecture * Medical Hygiene * Sanitary Environment Research Institute: How to distinguish a *habu* snake:

<http://www.pref.okinawa.lg.jp/site/hoken/eiken/eisei/habumiwakekata.html>

6-1-2. In order to not be bitten by a *habu* snake

1) If you see a *habu* snake, dial 110, and let them catch it.

✖ **Never try to catch it yourself.**

2) **Avoid areas with tall grass.**

6-1-3. *Habu* snakes' nature

1) *Habu* snakes cannot jump. If you are more than 1.5 meters away from a *habu*, it will not attack you.

2) *Habu* do not chase humans.

6-1-4. If you are bitten by a *habu* snake

1) Keep calm and make sure whether it is a *habu* or not. If it is a *habu*, there are usually two fang marks, and **it will become swollen in less than five minutes and be very painful.**

- 2) If it is a habu, yell for help, and ask someone to take you to a hospital, or dial **119** for an ambulance. (In Japan ambulances are free of charge.)
 - ※If you run, the poison can take effect more quickly, so walk slowly. Even if a few hours have passed after you were bitten, anti-venom serum can work.
 - ※If you go to a hospital, call the hospital before you arrive to make sure whether they have anti-venom serum or not. (→see reference data 1)
- 3) Suck out the poison with blood from the wound.
 - ※There is a special aspirator for this. If you don't have one, suck with your mouth. Even if you have a cut inside your mouth or if you swallow the poison, it will be harmless.
- 4) Lightly tie a tourniquet between the bite and your heart. If you tie it too tightly, you might lose a limb. Every fifteen minutes, briefly loosen the tourniquet.
- 5) Do not take medication to relieve pain and do not drink alcohol.

6-2. Dangerous land organisms

There are dangerous organisms besides *habu* in Okinawa.



6-2-1. Agate snail (*Africa maimai*)

The agate snail is a snail that was brought to Okinawa from a foreign country in the 1930. Its shell's height reaches more than 15 cm. It is an intermediary host for a parasite that is called the Kwangtung blood fluke, and if you are infected through the mouth, it causes a brain disorder, so never touch it.

6-2-2. Orvasca Taiwana (*Taiwan Kidoku-ga*)

The Orvasca Taiwana larva has many invisible hairs called nettling hairs, and it causes dermatitis if you touch the hair. The larva are usually born from April to June in an average year.



1) A symptoms and emergency measures

Symptoms such as itching or red blisters appear, but there are individual differences.

If you scratch, the symptoms will spread, so do not scratch. First, you should apply and remove adhesive tape on the itchy area to remove stinging hairs. Then, wash the skin with soap and apply antihistamine ointment. Visiting a dermatologist is recommended if severe itching, red swelling, or sores develop.



2) Prevention

- a) Do not touch the larva.
- b) As stinging hairs might be spread by the wind and fall to the ground, after you touch or sit on the ground, you should wash your hands with soap.

※The photograph was copied from the following site:

Wikipedia 'Agate snail'

6-3. Beware of dangerous marine organisms

In the ocean around Okinawa, there are poisonous creatures. Be cautious while playing along the coast and doing marine sports. Notable marine organisms are introduced here.

6-3-1. Habu jellyfish

A habu jellyfish's umbrella size is about 10cm to 14cm, and its tentacles are about 1.5m in length. They are found at beaches, seaside swimming areas, and fishing ports. Since its umbrella part is semitransparent and hard to see in the water, it is **better to swim at a beach that has a safeguard net for habu jellyfish**. Do not touch safeguard nets or buoys. Sometimes there are tentacles attached to them.

If you are stabbed by a habu jellyfish:

- 1) Pour table vinegar over the wound. (Do not rub it.)
- 2) Remove the tentacle.
- 3) Cover the wound with a towel that is soaked in table vinegar and then pour vinegar over the towel.
- 4) Keep the wound cool with ice or cold water and go to a hospital.



6-3-2. Crown of thorns

Crown of thorns are huge starfish that are 15cm to 60cm long. Their whole body is covered with poisonous spines. They live on reefs or coral reefs from 1m to 10m deep.

If you are stabbed by a crown of thorns,

- 1) Pull the spine out straight. (Since it is easy to break, be careful not to leave part of the spine behind in the skin.)
 - 2) Soak affected spot in 40 to 45 degree hot water for 30 to 60 minutes. →The pain will ease.
- ※If the condition is serious, go to a hospital.



6-3-3. Anboina snails

The Anboina snail is a Conidae, or cone snail, that is nocturnal in its habits. It is 10 to 13cm in size and inhabits shallow coral reefs and rocks in the sea. Since it has poisonous arrows to paralyze its prey, people gathering shellfish might become a victim because of lack of knowledge.

If you are stung,

- 1) Squeeze the poison out of a wound. (Do not suck it out with your mouth.)



- 2) In order to prevent the poison from spreading, tie the bite tightly.
- 3) Go to a hospital immediately.

6-3-4. Sea snakes

There are eight kinds of poisonous sea snakes in Okinawa. Even though they do not attack swimmers aggressively, they have a poison that is 10 to 20 times as strong as habu snake poison, so do not try to catch them or disturb them.

If you are bitten:

- 1) Squeeze the poison out of the wound.
- 2) In order to prevent the poison from spreading, tie the bite tightly.
- 3) Go to a hospital immediately.



6-3-5. Other dangerous marine organisms

In addition to the above, there are dangerous creatures and fish that do not have poison but will attack humans. Be careful when you play in the ocean or do marine sports.

1) Poisonous creatures, non-fish:



Long-spined sea urchin
lives in coral reefs.



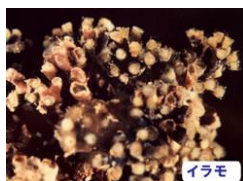
Flower sea urchin
lives in the rocks of
coral reefs.



Mirebora coral
lives near coral reefs at a depth of 30cm.



Unbachi sea anemone
lives at a depth of about 20cm inside reefs.



Iramo (a type of jellyfish)
lives near coral reefs and shallow shore reefs and swims in the sea.



Portuguese man-of-war (also known as *denki kurage*)
lives in the ocean but is driven ashore to beaches and coves by
wind and waves.



Rubus fritillary octopus
lives in tidal pools, shallow shore reefs, or in gravel.

2) Poisonous fish with fins:



Demon daruma stinger
lives in shallow coral reefs or shore reefs.



Euscaphis japonica



Lion fish



Stingray
lives near shallow, sandy beaches, muddy seabeds

3) Fish that attack humans:



Needlefish (When startled by a light at night, will sometimes attack and bite humans.)



Shark (Many tiger sharks are seen near Okinawa.)

Pictures are copied from the following sites:

Amami Ocean Exhibition Hall – Dangerous Ocean Creatures: <http://www.michinoshima.jp/node/29>

Outdoor Hobby Information Site – Dangerous Creatures Information (Poisonous Creatures/Deadly Creatures):
<http://outdoor.ymnext.com/topnavi-01.html>

Nakijin Beach Nature School – Dangerous Ocean Creatures in Okinawa: <http://www.umibe-nature.com/040108ka.htm>

Illustrated Guide to Fish and Shells by *Bouz Konyaku*: <http://www.zukan-bouz.com/fish/datu/datu.html>

Wikipedia.org - Amboinagai <https://ja.wikipedia.org/wiki/アンボイナガイ>

6-4. Beware of heatstroke

Heatstroke is a disorder that occurs when you lose the balance between your body water and salt, and your body loses the ability to regulate heat; it sometimes leads to death. As [heatstroke is especially common between the end of the rainy season and the end of September](#) in Okinawa, beware.

6-4-1. Conditions that lead to heatstroke

1) When the temperature and humidity are high.

- 2) When there is little wind and strong sunshine.
- 3) When there is a lot of reflected heat.
- 4) When you quickly become overheated.

When the risk of getting heatstroke is high, when the heat index is over 33°C, a heatstroke alert will be announced. Announcements will be made twice a day, at 17:00 the day before and at 5:00 on the day. When this alert is issued, you should take these actions to avoid dangerous heat:

- ① Avoid going out.
- ② Keep cool using air-conditioning.
- ③ Drink water before you feel thirsty. Stay hydrated.

It is also possible to get this information through news and weather forecasts, and there is also text-message/email delivery service.

To register for heatstroke precaution alert mail delivery service for computers and smartphones, go to: <https://plus.sugumail.com/usr/env/home>.

Daily heat index information is as follows

There is a Ministry of the Environment heatstroke prevention information site at: <https://www.wbgt.env.go.jp/>. It shows the day's heat index levels all over Japan.

The explanation of the different color levels on the heat index website at <https://www.wbgt.env.go.jp/wbgt.php> is as follows:

Heat index <i>Atsusa shisu</i> WBGT	Precautions
<i>Atsusa shisu</i> -Heatstroke warning Extreme danger! (above 31°C)	Do not go out if possible. Stay in a cooled room. (The elderly risk heatstroke even indoors if the room is not cooled.)
Becoming dangerously high alert (28-31°C)	When going out, avoid being in direct sunlight. Indoors, be cautious of the rising room temperature.
Alert (25-28°C)	When doing sports or hard work, take regular breaks and hydrate.
Caution (under 25°C)	Even though the risk is low, when doing heavy exercise or heavy work, it is possible to suffer heatstroke.

※ The index to prevent heatstroke was created in the United States in 1954. It is based on humidity, temperature, and the surrounding heat environment.

6-4-2. Heatstroke symptoms

- 1) High body temperature
- 2) Dry skin (heat exhaustion, a precursor to heatstroke, includes profuse sweating)

- 3) Headache
- 4) Throbbing head pain
- 5) Dizziness
- 6) Nausea
- 7) Mental confusion

6-4-3. In order to avoid heatstroke

- 1) If you are inside
 - a) Drink water and eat enough salt. **Alcohol doesn't count as a liquid!**
 - b) Block direct sunlight with a curtain.
 - c) Open a window for ventilation or use a fan or an air conditioner.
 - ※Set the air conditioner at around 26 degrees.
 - d) Wear clothes that are highly hygroscopic (that breathe).
- 2) If you are outside
 - a) Drink water and eat sufficient salt.
 - ※**Alcohol doesn't count as a liquid!**
 - b) Use a parasol or wear a hat.
 - c) Do not exercise or work under the blazing sun for a long time. When you work, pitch a tent or do something to create shade, and also take a rest occasionally.
 - d) Wear clothes that are highly hygroscopic (that breathe).
 - ※**Avoid black clothes because black absorbs solar heat.**

6-4-4. If heatstroke is suspected

If you think someone near you has heatstroke, do the following:

- 1) Dial **119** and ask for an ambulance. (In Japan ambulances are fee.)
- 2) Move the person to a cool place like in the shade of a tree or a room with an air conditioner.
- 3) Cool the body (by pouring water over the skin, fanning, or putting an ice bag on the neck, under the armpit, or in the crotch area).
- 4) If the person can drink, give them cold water to drink.
 - ※If the person has been sweating a lot, a **sport drink is effective.**

7. Emergency contacts

When a big disaster occurs, not only gas and water but also telephone service often stops. Cellphones and mail cannot be used. When the East Japan Disaster struck in March 2011, because of a power breakdown, not only the Internet but also both fixed-line phones and cellphones couldn't be used for a few days to one week.

7-1. Beware of emergencies

- 1) If a big disaster occurs, the university will check your safety, mainly through e-mail or a text message. [Register your mail address or cellphone address with the office if possible, so we will be able to contact you.](#) If you change your mail address, inform us promptly.
- 2) If you are living with your family, discuss how you will reach each other in case of a disaster. (For example, decide on a meeting place, etc.)

7-2. In case of a big disaster

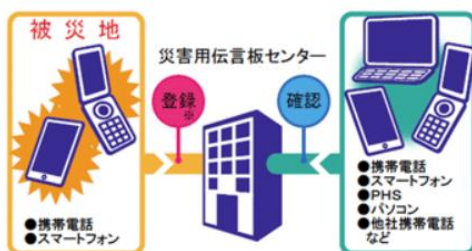
- 1) The university will contact you to check on your safety.
- 2) If a big disaster occurs, because not only the campus but also the university staff will suffer from the disaster, it is possibility that we cannot contact you immediately. Contact the university yourself if you can.
- 3) Contact each other and check on each other's safety.
- 4) The university will try to contact you through the university homepage. If you can use the Internet, try to access the university homepage.

7-3. Things you should be careful of

When the East Japan Disaster occurred in March 2011, the Internet and chain mail spread untrue information to the effect that one country would send a charter jet to save people from their country, so come to the airport on such and such day. It confused many people. It is common for such rumors to spread abroad in a disaster. [In order to not be confused by false rumors, get information from trusted sites \(like the university homepage, the Meteorological Agency homepage, the NHK homepage, or your country's governmental homepages\).](#)

7-4. How to make contact using a cellphone, a fixed-line phone, a smartphone, or a tablet

- 1) In the event of a major disaster, a " Bulletin board for disaster " is available. Messages can be checked even from overseas, but the method of use differs according to each company (NTT Docomo, au, Softbank), so please check in advance.



NTT docomo

https://www.docomo.ne.jp/info/disaster/disaster_board/

au

<https://www.au.com/mobile/anti-disaster/saigai-dengon/>

Softbank iPhone, SoftBank smartphone, tablet

<https://www.softbank.jp/mobile/service/dengon/boards/>

- 2) When an earthquake registering 6-weak or more on the Japanese seismic scale occurs, NTT will start a bulletin board for disaster service. Dial 177 to register or play messages.

Bulletin board for disaster

<https://www.ntt-west.co.jp/dengon/171>

8. Reference data and sites

(Typhoons)

Sediment The Meteorological Agency: Disaster alert information

<http://www.jma.go.jp/jma/kishou/known/bosai/doshakeikai.html>

Meteorological Agency: Record short-time heavy rain information

<http://www.jma.go.jp/jma/kishou/known/bosai/kirokuame.html>

The Meteorological Agency: Weather information service and alert levels

<https://www.jma.go.jp/jma/kishou/known/bosai/alertlevel.html>

(Earthquakes)

NPO Disaster Damage Prevention NPO Miraikai “Plates around the Japanese islands”:

<http://www5d.biglobe.ne.jp/~miraikai/nihonnopureito.htm>

Asahi Gakusei Shimbunsha Junior Asahi “Japan is a major earthquake nation”:

http://www.asagaku.com/kokoku/jishin_tsunami/nihonwajisintaikoku.html

Are there few earthquakes in Okinawa? (Science Department, Dr.Mamoru Nakamura’s laboratory homepage):

http://seis.sci.u-ryukyu.ac.jp/hazard/large-eq/okinawa_earthquake.html

Okinawa prediction map for the probability of seismic vibration (Science Department, Dr. Mamoru Nakamura’s laboratory homepage):

<http://seis.sci.u-ryukyu.ac.jp/hazard/hazard-eq/index.html>

Editorial in the *Ryukyu Shimpou* (February 28, 2010): *An earthquake off the Okinawa mainland: It is necessary to be prepared for a state of emergency*

<http://ryukyushimpo.jp/news/storyid-158368-storytopic-11.html>

Editorial in the *Ryukyu Shimpou* (February 28, 2010): *An earthquake off the Okinawa mainland: A comment by an informed person—It is a superstition that there are few earthquakes*: <http://ryukyushimpo.jp/news/storyid-158384-storytopic-1.html>

Editorial in the *Ryukyu Shimpou* (February 28, 2010): *An earthquake off the Okinawa mainland: If an earthquake occurs....* Manual of Earthquake Disaster Prevention:

<http://ryukyushimpo.jp/news/storyid-158391-storytopic-1.html>

Results of Okinawa Prefecture earthquake damage prediction research in 2013:

<http://www.pref.okinawa.jp/site/chijiko/bosai/h25jishinhigaisoutei.html>

Manual on earthquake damage prevention by the Fire and Disaster Management Agency: http://www.fdma.go.jp/bousai_manual/index.html

Foundation Institute for Fire Safety & Disaster Preparedness: “Have confidence against an earthquake” [http://www.bousaihaku.com/cgi-](http://www.bousaihaku.com/cgi-bin/hp/index2.cgi?ac1=B107&ac2&ac3=3907&Page=hpd2_view)

[bin/hp/index2.cgi?ac1=B107&ac2&ac3=3907&Page=hpd2_view](http://www.bousaihaku.com/cgi-bin/hp/index2.cgi?ac1=B107&ac2&ac3=3907&Page=hpd2_view)

Kouchi Prefecture General Affairs Department Crisis Management the *Nankai* Trough Earthquake Countermeasure Division: “Preparing for a *Nankai* Trough earthquake and living through it,” revised.

<http://www.pref.kochi.lg.jp/soshiki/010201/sonaetyoki-pumphlet.html>

<http://www.pref.kochi.lg.jp/soshiki/010201/files/2014012000352/sonaetyoki2017.pdf>

Meteorological Agency Earthquake Early Warnings:

<http://www.data.jma.go.jp/svd/eww/data/nc/koudou/koudou.html>

NHK Ringtone: <http://www.nhk.or.jp/sonae/bousai/>

NTT docomo Cellular Phone Buzzer Sound

<https://www.nttdocomo.co.jp/service/areamail/index.html>

Urgent Earthquake Breaking News Signature Sound http://www.real-time.jp/?page_id=465

(Tsunami)

The Meteorological Agency: “About tsunami warnings, advisories, tsunami information, and tsunami forecasts”

<http://www.data.jma.go.jp/svd/eqev/data/joho/tsunamiinfo.html>

Tsunami *Keiho* Changed (Meteorological Agency Leaflet)

<http://www.jma.go.jp/jma/kishou/books/tsunamikeihou/>

<http://www.jma.go.jp/jma/kishou/books/tsunamikeihou/tsunamikeihou2013.pdf>

The Meteorological Agency: Safety from *tsunami* (*tsunami*-flag)

https://www.data.jma.go.jp/svd/eqev/data/tsunami_bosai/tsunami_bosai_p2.html

Prediction of tsunami height in case an earthquake occurs off Okinawa (Science Department, Dr. Mamoru Nakamura’s laboratory homepage):

<http://seis.sci.u-ryukyu.ac.jp/hazard/tsunami/index.htm>

Okinawa Prefecture tsunami/flood damage prediction (March 2015) tsunami/flood damage prediction map:

http://www.pref.okinawa.lg.jp/site/doboku/kaibo/h27tsunami/h27tsunami_b.html

Ryukyu Shimpou: “Make five meters above sea level the minimum flood level—Okinawa Prefecture Earthquake and Tsunami Assumption Examination Committee”

<http://ryukyushimpo.jp/news/storyid-181597-storytopic-3.html>

Mapion: The 47 prefectures of Japan map, Okinawa (after the destination map appears, right click the mouse)

<http://www.mapion.co.jp/map/admi47.html>

The Okinawa Prefectural Police Department: All-Okinawa altitude map

<http://www.police.pref.okinawa.jp/docs/2015042100012/>

(Tornadoes)

The Meteorological Agency: What severe gusts like tornadoes are

<http://www.jma.go.jp/jma/kishou/now/toppuu/tornado1-1.html>

The Meteorological Agency: How to protect yourself from a tornado

<http://www.jma.go.jp/jma/kishou/now/toppuu/tornado4-3.html>

Meteorological Agency leaflet: “Protect yourself from tornadoes: tornado watch information” <http://www.jma.go.jp/jma/kishou/books/tatsumaki/index.html>

The Meteorological Agency Tornado-producing probability, “now-cast”:

<http://www.jma.go.jp/jma/kishou/now/toppuu/tornado3-1.html>

(Habu snakes)

Okinawa Prefecture Home Page: Beware of habu snakes!

<http://www.pref.okinawa.lg.jp/site/hoken/eiken/eisei/habutop.html>

Okinawa Prefecture Pharmaceutical Affairs Disease Control Support Division Pamphlet ‘Beware of habu snakes!’

<http://www.pref.okinawa.lg.jp/site/hoken/eiken/eisei/documents/habudai5hank.pdf>
Okinawa Prefecture Pharmaceutical Affairs Disease Control Support Division
'About Habu'

<http://www.pref.okinawa.lg.jp/site/hoken/seikatsueisei/yakumu/habu.html>
Okinawa Prefecture Pharmaceutical Affairs Disease Control Support Division
'Habu Antitoxin Reserve Medical Institution'

https://www.pref.okinawa.jp/site/hoken/seikatsueisei/yakumu/documents/koudokusojoyobiiryokikan_r41024.pdf

(Agate snail (*Africa maimai*))

Okinawa Prefecture Pest Prevention Technology Center

<http://www.pref.okinawa.jp/mibae/maimai/>

National Institute for Environmental Studies: Invasive creature database

<https://www.nies.go.jp/biodiversity/invasive/DB/detail/70250.html>

(Orvasca taiwana (*Taiwan Kidoku-ga*))

Okinawa Prefecture Home Page: 'Beware of orvasca taiwana'

<http://www.pref.okinawa.jp/site/hoken/eiken/eisei/taiwankidokuga.html>

Dermatitis by Orvasca Taiwana (Okinawa hygiene environmental laboratory)

<http://www.pref.okinawa.jp/site/hoken/eiken/news/documents/28page2.pdf>

(Dangerous marine organisms)

Amami Marine Exhibition Hall: "Dangerous organisms in the sea":

<http://www.michinoshima.jp/node/29>

General Information about outdoor hobbies site, Information of life-threatening creatures:

<http://outdoor.ymnext.com/topnavi-01.html>

Umibe-Nature School in Nakijin, Dangerous marine organisms in Okinawa:

<http://www.umibe-nature.com/040108ka.htm>

Bouz Konjak Marketplace fish and shellfish dictionary:

<http://www.zukan-bouz.com/fish/datu/datu.html>

Wikipedia.org - Anboina shells: <https://ja.wikipedia.org/wiki/アンボイナガイ>

The Japan Coast Guard Nago Coast Guard Station report No.9 12 Sept. 2014,
Examples of being killed and wounded by a needlefish:

<http://www.kaiho.mlit.go.jp/11kanku/naha/gyoumu/gyoumugaiyou/nagotsushin/H26/No.9.pdf>

Yasuhiro MIYAHARA, Yasunori ARAKI, *Habu and Dangerous Marine Organism Handbook*, Mugen publishing company, 2014

(Heatstroke)

The Ministry of the Environment Ministry, Heatstroke, environmental insurance manual:

http://www.wbgt.env.go.jp/heatillness_manual.php

Ministry of the Environment heatstroke prevention information site: Heatstroke caution alert

<https://www.wbgt.env.go.jp/alert.php>

What is heat index? <https://www.wbgt.env.go.jp/wbgt.php>

(Sources for the latest information about typhoons, earthquakes, and tsunami)

Okinawa Prevention Disaster Information Portal site '*Haisai! Boosai Debiru*', All
Okinawa: Okinawa Prefecture disaster damage prevention weather report
(English, Chinese (Chinese traditional, simplified Chinese characters), Korean)
<http://www.bousai.okinawa.jp/>

(Disaster damage prevention as a whole)

The Meteorological Agency Home Page 'Protect yourself from disaster: Protect from
tornadoes, lightning, tsunami, earthquakes, and heavy rain' (English available)
http://www.jma.go.jp/jma/kishou/fukyu_portal/

(Area electronic alert)

NTT docomo <https://www.docomo.ne.jp/service/areamail/>
Softbank https://www.softbank.jp/mobile/service/urgent_news/
au <https://www.au.com/mobile/anti-disaster/kinkyu-sokuho/>

The Meteorological Agency Multilingual Dictionary of Urgent Earthquake Breaking
News, Tsunami Warnings (English, Chinese [Chinese traditional, simplified Chinese
characters], Korean, Portuguese, Spanish, and easy Japanese)
<http://www.data.jma.go.jp/svd/eqev/data/tagengo/tagengo.html>

(Others)

Shimonoseki City Fire Brigade homepage: The difference between an evacuation
"recommendation" and an evacuation "order"
<http://www.svfc.jp/blog110907150222.html>

General Incorporated Foundation Okinawa Convention & Visitors Bureau
<http://www.okinawastory.jp/dc/>

Okinawa Sightseeing Safety and Security Guide
(English, Chinese [Chinese traditional, simplified Chinese characters], Korean)
Communication sheet on disaster (In Chinese traditional, simplified Chinese
characters, Korean)

(Means of contact in case of emergency)

Kadokawa shoten weekly aski; Summary of the means of contacting people in a
disaster area through the Internet or by telephone:
<http://weekly.ascii.jp/elem/000/000/037/37110/>

Reference data 1: Medical institutions that provide antitoxin for *habu* snakebites as of October 2022

P U B L I C H E A L T H C E N T E R R E G I O N S	H	1	<i>Kenritsu Hokubu Byoin</i>	<i>Nagoshi Oonaka 2-12-3</i>	0980-52-2719
	O	2	<i>Hokubu Chiku Ishikai Byoin</i>	<i>Nagisgu Aza Umusa 1712-3</i>	0980-54-1111
	K	3	<i>Kenritsu Hokubu Byoin Fuzoku Iheya Shinryosho</i>	<i>Iheyamura Aza Gakiya 217</i>	0980-46-2116
	U	4	<i>Ie Sonritsu Shinryosho</i>	<i>Iemura Aza Higashiema 459</i>	0980-49-2054
	B	5	<i>Kunigami Sonritsu Shinryosho</i>	<i>Kunigamison Aza Hedona 1437</i>	0980-41-5380
	I				
	C				
	H	6	<i>Kenritsu Chubu Byoin</i>	<i>Ueumahi Aza Miyazato 281</i>	098-973-4111
	N	7	<i>Shakai Iryou Hojin Keiaikai Nakagami Byoin</i>	<i>Okinawashi Chibana 6-25-5</i>	098-939-1300
	O	8	<i>Tokutei Iryo Hojin Okinawa Tokushukai Byoin</i>	<i>Okinawashi Teruya 3-20-1</i>	098-937-1110
	R	9	<i>Iryo Hojin Jinseikai Naka Byoin</i>	<i>Kadenacho Kadena 258</i>	098-956-1161
	T	10	<i>Tokutei Iryo Hojin Kariyushikai Heart Life Byoin</i>	<i>Nakagusukuson Iju 208</i>	098-895-3255
	E				
	R				
	A				
	L				
S O U T H	N	11	<i>Iryo Hojin Wa no Kai Yonabaru Chuou Byoin</i>	<i>Yonabarucho Aza Yonabaru 2905</i>	098-945-8101
	A	12	<i>Iryo Hojin Okinawa Tokushukai NanbuTokusyukai Byoin</i>	<i>Yaesecho Aza Hokama 171-1</i>	098-998-3221
	B	13	<i>Iryo Hojin Yuaikai Yuuai Medical Center</i>	<i>Tomigusukushi Yone 50-5</i>	098-850-3811
	U	14	<i>Kenritsu Nanbu Iryo Center ・ Kodomo Iryo Center</i>	<i>Haebarucho Aza Arakawa 118-1</i>	098-888-0123

C H U O C E N T E R	15	Okinawa Sekijui Byoin	Nahashi Yogi 1-3-1	098-853-3134
	16	Naha Shiritu Byoin	Nahashi Furujima 2-31-1	098-884-5111
	17	Shakai Iryo hojin Jinaikai Urasoe Sogo Byoin	Urasoeshi Iso 4-16-1	098-878-0231
	18	Koritsu Kumejima Byoin	Kumejimacho Aza Kadekaru 572-3	098-985-5555
	19	Kenritsu Nanbu Iryo Center Fuzoku Tokashiki Shinryosho	Tokashikimura Aza Tokashiki 277	098-987-2028
	20	Kenritsu Nanbu Iryo Center Fuzoku Tonaki Shinryosho	Tonakimura 1916-1	098-989-2003
	21	Ryukyudaigaku IgakubuFuzoku Byoin	Nishiharacho Uehara 207	098-895-3331
	22	Okinawa Kyodo Byoin	Nahashi Kohagura 4-10-55	098-853-1200
	23	Kenritsu Yaeyama Byoin	Ishigakishi Aza Ookawa 732	0980-83-2525
	24	Kenritsu Yaeyama Byoin Fuzoku Iriomote Seibu Shinryosho	Taketomicho Iriomote 694	0980-85-6268
A M A	25	Kenritsu Yaeyama Byoin Fuzoku Kohama Shinryosho	Taketomicho Aza Kohama 30	0980-85-3247

https://www.pref.okinawa.jp/site/hoken/seikatsueisei/yakumu/documents/koudokusojobiiryokikan_r41024.pdf

(Okinawa Prefecture homepage)

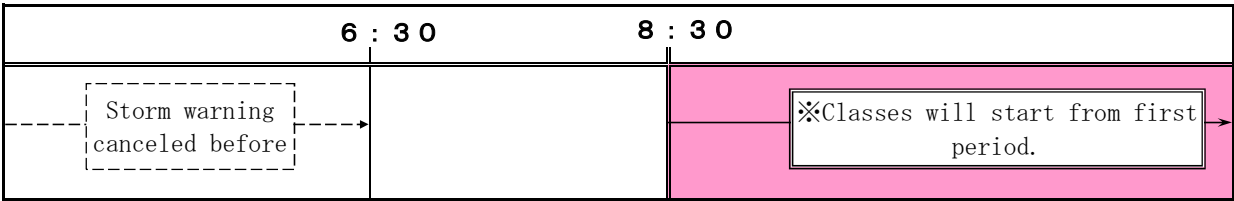
Reference data 2: University of the Ryukyus homepage: Arrangements for handling classes and final examinations in the event of a storm-warning announcement

1. When a typhoon is approaching, pay great attention to typhoon reports on the TV and radio.
2. Types of warnings and emergency warnings and the conducting of classes and final examinations by area.

Warning・Emergency Warning		Issued Area	Conducting of classes and final examinations	
Storm warning	Storm warning Storm emergency warning	Main island of Okinawa	Class: Canceled	
			Final examination: Postponed until make-up day	
	Heavy rain emergency warning	Central and southern cities, towns & villages	Class: Canceled	
			Final examination: Postponed until make-up day	
Heavy emergency warning		Except for central and southern students	If students cannot safely attend, do not count as an absence.	
			If they cannot take an examination, administer a makeup examination.	
High wave emergency warning		Main island of Okinawa	If students cannot safely attend, do not count as an absence.	
			If they cannot take an examination, administer a makeup examination.	
Storm surge emergency warning		Main island of Okinawa	If students cannot safely attend, do not count as an absence.	
			If they cannot take an examination, administer a makeup examination.	
Others		Main island of Okinawa	To be decided through consultation between the university president and the director in charge of education.	

3. Cancellation details:

- (1) If a storm or other warning is canceled before 6:30 a.m., classes will start from the first period.



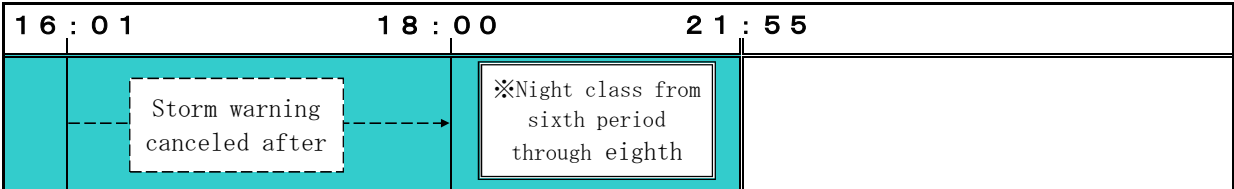
- (2) If a storm or other warning is canceled between 6:31 a.m. and 11:00 a.m., class will start from the third period.



- (3) If a storm or other warning is canceled between 11:01 a.m. and 4:00 p.m., class will start from the sixth period.



- (4) If a storm or other warning is canceled after 4:01 p.m., all classes will be canceled.



Note: The issuing and cancellation times for storm warnings depend on announcements by the Okinawa

Reference data 3: Disaster words that are useful to memorize in Japanese

カテゴリー category	にほんご 日本語 Japanese	English
たいふう 台風 Taifuu a typhoon	たいふう 台風Taifuu	a typhoon
	ぼうふうけいほう 暴風警報Boofuu keehoo	a storm warning
	ぼうふうとくべつけいほう 暴風特別警報 Boofuu tokubetsu keehoo	a storm emergency warning
	おおあめとくべつけいほう 大雨特別警報 Ooame tokubetsu keehoo	a heavy rain emergency warning
	はろうとくべつけいほう 波浪特別警報 Haroo tokubetsu keehoo	a high wave emergency warning
	たかしおとくべつけいほう 高潮特別警報 Takashio tokubetsu keehoo	a storm surge emergency warning
	きょうふうちゅういほう 強風注意報Kyoofuu chuuihoo	a gale advisory
じしん 地震 Jishin an earthquake	じしん 地震Jishin	an earthquake
	しんど 震度Shindo	seismic intensity
	マグニチュード Magunichuudo	magnitude
	きんきゅうじしんそくほう 緊急地震速報 inkyuu jishin sokuhoo	an earthquake early warning
たつまき 竜巻Tatsumaki a tornado	たつまき 竜巻Tatsumaki	a tornado
つなみ 津波 Tsunami a tsunami	つなみ 津波Tsunami	a tsunami
	おおつなみけいほう 大津波警報00tsunami keehoo	a major tsunami warning
	つなみけいほう 津波警報Tsunami keehoo	a tsunami warning
	つなみちゅういほう 津波注意報Tsunami chuuihoo	a tsunami advisory
きょうつう 共通	とくべつけいほう 特別警報Tokubetsu keehoo	an emergency warning
	けいほう 警報Keehoo	a warning
	ちゅういほう 注意報Chuuihoo	an advisory
	ひなんしじ 避難指示Hinan shiji	an evacuation direction
	ひなんかんこく 避難勧告Hinan kankoku	an evacuation recommendation
	はっせい ～が発生しました ～ga hassee shimashita 例) 台風が発生しました。 Ex. Taihuu ga hassee	~ has developed Ex. A typhoon has developed.

	shimashita.	
	^{はっぴょう} ～が発表されました ～ga happyou saremashita 例) ^{ぼうふうけいほう} 暴風警報が ^{はっぴょう} 発表されました。Ex. Boofuu keehoo ga happyou saremashita.	~ has been issued Ex. A storm warning has been issued.

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〒903-0213 1 Aza Senbaru Nishihara-Cho Okinawa