

Storm Surges

When a typhoon or a developed low-pressure system passes through, the tide level may rise significantly, and this is called a storm surge. A storm surge is mainly caused by the 'inverted barometer effect caused by low pressure' and 'drift effect caused by wind.' When it coincides with high tide, the water level rises further, increasing the likelihood of a large-scale disaster.

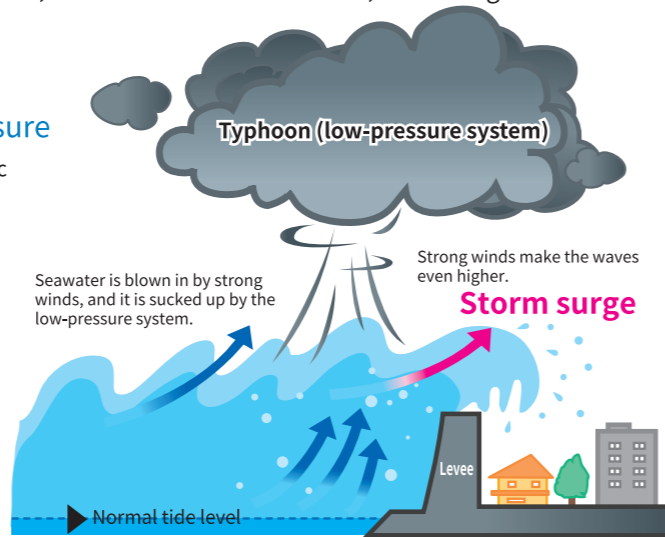
Mechanisms of a storm surge

Inverted barometer effect caused by low pressure

At the center of a typhoon or low-pressure system, the atmospheric pressure is lower than the surrounding area, so the air in that area sucks up the water surface, causing the sea level to rise. A 1 hPa (hectopascal) drop in atmospheric pressure causes a 1 cm rise in sea level.

Drift effect caused by wind

When strong winds such as typhoons blow from offshore to the coast, seawater is blown towards the coast and the sea level rises. If the wind speed doubles, the rise in tide level will quadruple. In addition, the winds of the approaching typhoon generate large waves, further raising the sea level.



Glossary of Storm Surge Terms

Emergency Warning for Storm Surge

Meteorological information released by the Japan Meteorological Agency when a storm surge is expected due to a once-in-a-decade typhoon or similar extratropical cyclone

Storm Surge Warning

Meteorological information released by the Japan Meteorological Agency when there is an expected risk of a serious disaster due to an abnormal rise in sea levels caused by a typhoon, and the tide level is expected to exceed the average sea level of Tokyo Bay (T.P) by 2.3 m

Storm Surge Advisory

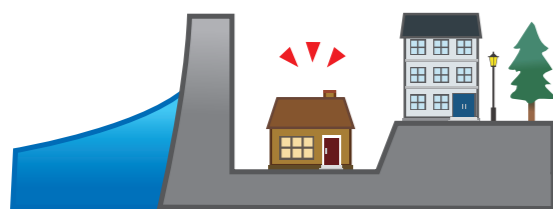
Meteorological information released by the Japan Meteorological Agency when there is an expected risk of a disaster due to an abnormal rise in sea levels caused by a typhoon, and the tide level is expected to exceed the average sea level of Tokyo Bay (T.P) by 1.6 m

Sea Level Anomaly

The difference between the astronomical tide calculated from the movement of celestial bodies and the actual tide level affected by weather and other factors

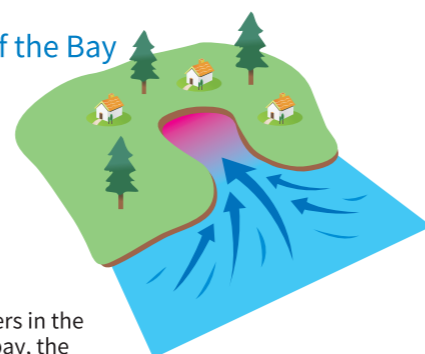
Dangers of Storm Surge

Low-lying Areas Near the Coast



Low-lying areas near the coast are at high risk of flooding due to storm surges.

Inner Part of the Bay



As seawater gathers in the inner part of the bay, the water level in the bay rises.

Main Damage Caused by Storm Surges

Isewan Typhoon

The Isewan Typhoon landed on the Kii Peninsula on September 26, 1959. It caused damage across the country, leaving 5,098 people dead or missing. There were victims across the 32 prefectures, but 83% of them were concentrated in Aichi and Mie prefectures due to storm surges. 14 people died in Kariya City, and about 26% of the population suffered significant harm.

<<Damage in Kariya City>>

Total number of victims	Human casualties		Damage to buildings 9,940 units (of which 250 were flooded above floor level)
	Dead	Injured	
15,030	14	105	

Evacuation Information and Instructions

The city will issue evacuation information if the risk of disaster increases and it becomes necessary to urge citizens to evacuate. If an alert level 4 "evacuation order" is issued, all people in dangerous locations must evacuate.

Alert Level	Evacuation Information, etc.	Instructions
5	Ensure Emergency Safety (issued by the city)	- Your life is at risk. Ensure your own safety to the possible extent.
Everyone must evacuate from dangerous locations by the time Alert Level 4 is issued		
4	Evacuation Order (issued by the city)	- Everyone should evacuate to a safe evacuation shelter.
3	Evacuation of Elderly People (issued by the city)	- People who need time to evacuate and their helpers should evacuate to a safe evacuation shelter. - Be ready to evacuate everyone at any time.
2	Storm Surge Advisory, etc. (announced by the Japan Meteorological Agency)	- Prepare for evacuation and check your own evacuation action according to the hazard maps and other similar information.
1	Early Warning Information (announced by the Japan Meteorological Agency)	- Increase awareness about disasters.

* The various pieces of information may not be announced in the order of Alert Levels 1 to 5.

Weather Information for Disaster Prevention

Alert Level 5 Equivalent Information

- Information on Flooding

Alert Level 4 Equivalent Information

- Emergency Warning for Storm Surge
- Storm Surge Warning, etc.

Alert Level 3 Equivalent Information

- Storm surge advisories that are likely to be replaced by storm surge warnings

This information is for residents' reference when taking independent action to evacuate.

Get Disaster Information

To ensure that you obtain disaster information including evacuation information properly, it is important to have two or three methods to acquire this information. Use the disaster information service provided by Kariya City to prepare for disasters.

Kariya City Text Distribution Service

[Available information]

- Evacuation information -Warnings, Advisories -Earthquake information

[How to Register]

- (1) Send information such as evacuation information, weather information, and other disaster information to your registered email address
- (2) Send a blank email to "t-kariya@sg-p.jp"
- (3) Register by accessing the URL in the e-mail sent for this registration



▲City website

Kariya City Portal App "Aikari"

[Available information]

- Evacuation information -Warnings, Advisories -Earthquake information

This app allows you to receive new notifications at any time by selecting the type of information you want in advance, such as for disasters and child care. You can receive disaster information similar to the Text Distribution Service.



▲City website

Kariya city disaster prevention radio

[Available information]

- Evacuation information -Earthquake information

This is a radio broadcast to inform you about emergency information broadcasts from Kariya City such as evacuation orders and information such as emergency Earthquake Early Warnings relayed by J-Alert. If you insert the power plug into the outlet and leave it in standby mode, it will automatically start up, and the emergency broadcast will be played at maximum volume.



▲City website