

The following are the major disasters that have hit the area in recent years.

1. 1978 Miyagi Earthquake (June 12, 1978)

This was a magnitude-7.4 earthquake with a hypocenter off the coast of Miyagi Prefecture and is considered a typical urban earthquake. The earthquake resulted in 16 fatalities and 10,119 injured because of the collapse of concrete-block walls, broken glass, falling objects, and other reasons. In addition, 4,385 houses were either completely destroyed or damaged, which was mainly due to factors such as the type of ground. There was also major damage to utilities necessary for daily life such as electricity, gas, and water, which had a major impact on the lives of residents. In particular, it took a month to restore gas.

The earthquake is known as the second most destructive urban earthquake after WWII, (the strongest being the 1995 Great Hanshin/Awaji Earthquake) which resulted in the Japanese government revising the Building Standards Act and strengthening earthquake-resistance standards.

2. Typhoon Georgette and torrential rains of August 5, 1986

Typhoon Georgette caused record-setting torrential rains—total rainfall of 402 mm and maximum hourly rainfall of 40 mm. The rain caused flooding in wide areas of east Sendai, particularly in residential and agricultural areas—5,666 buildings were flooded.

3. Great East Japan Earthquake (Tohoku Region Pacific Coast Earthquake) (March 11, 2011)

This was a magnitude-9.0 earthquake with a hypocenter located off the Sanriku coast of the Tohoku region. It was the largest recorded earthquake ever in Japan. The earthquake caused not only violent shaking but also a tsunami. The tsunami resulted in flooding in an extensive area, particularly the east part of Sendai. In residential areas that extend into the hilly area of the city, the violent shaking caused damage to not only buildings but also ground and retaining walls. Furthermore, the earthquake resulted in 863 casualties, 31 missing, and 2,269 injured (as of May 31, 2012).

According to estimates by the Japan Meteorological Agency, a tsunami 7.2 meters high hit the Port of Sendai, and research by the Geospatial Information Authority of Japan (GSI) reveal that areas up to 5 km inland were flooded. The

GSI also reported that the tsunami flooded around 52 km<sup>2</sup> of land, mainly agricultural land, and damaged around 8,000 households.

The earthquake had a major impact on the lives of residents. Many people had to evacuate their homes, with the number reaching a high of 106,000; there was also major damage to utilities necessary for daily life such as electricity, gas, and water.

The following are major disasters that are expected to hit Sendai in the future. The forecasts are based on various information including previous disasters.

1. Earthquake with a hypocenter in the Japan Trench and subsequent tsunami (various sizes)

It is important to prepare for not only earthquakes of a magnitude between 7 and 8, which occur every couple of decades, but also earthquakes of a magnitude equivalent to the recent Great East Japan Earthquake, that are thought to occur once every couple of centuries, and the subsequent tsunami.

2. Earthquake directly below the city with a hypocenter on the Nagamachi-Rifu Fault

There is a known active fault that runs from the northeast part of the city center to the southwest. The fault is not well known, and there are concerns of major damage if an earthquake were to hit.

3. Flooding caused by torrential rains from typhoons or seasonal rain fronts