

= 1934 Muroto typhoon =

In September 1934 , a violent typhoon caused tremendous devastation in Japan , leaving more than 3 @, @ 000 people dead in its wake . Dubbed the Muroto typhoon (???? , Muroto Taif?) , the system was first identified on September 13 over the western Federated States of Micronesia . Moving generally northwest , it eventually brushed the Ryukyu Islands on September 20 . Turning northeast , the typhoon accelerated and struck Shikoku and southern Honshu the following morning . It made landfalls in Muroto , Kaifu , Awaji Island , and Kobe . A pressure of 911 @. @ 9 hPa (26 @. @ 93 inHg) was observed in Muroto , making the typhoon the strongest ever recorded to impact Japan at the time . This value was also the lowest land @-@ based pressure reading in the world on record at the time ; however , it was surpassed the following year during the 1935 Labor Day hurricane . After clearing Japan , the now extratropical storm traveled east and weakened . Turning north by September 24 , the system deepened and impacted the Aleutian Islands ; it was last noted the following day over western Alaska .

Regarded as the " second @-@ greatest catastrophe of modern Japan " , the storm left parts of Osaka in ruins . Tens of thousands of structures were damaged or destroyed , leaving approximately 200 @, @ 000 people homeless . Among the 3 @, @ 066 people killed were 421 children and teachers who perished when their flimsy schools were destroyed . This ranked it , at the time , as the deadliest typhoon in Japanese history . In addition to the fatalities , 13 @, @ 184 people were injured . Total damage exceeded \$ 300 million (1934 USD) .

= = Meteorological history = =

On September 13 , 1934 , a tropical cyclone developed over the western Caroline Islands . The storm traveled generally northwest , executing a brief cyclonic loop on September 14 ? 15 . After a brief stint traveling nearly due north on September 17 , the cyclone began recurving to the northeast . It brushed the Ryukyu Islands to the southeast on September 20 as it accelerated northeast . On the morning of September 21 , the typhoon struck Shikoku and southern Honshu . According to the Central Meteorological Observatory (now called the Japan Meteorological Agency) , maximum sustained winds reached 150 km / h (90 mph) , with gusts exceeding 215 km / h (130 mph) .

The typhoon first made landfall over Muroto , K?chi Prefecture , resulting in it later being dubbed the " Muroto typhoon " . A then @-@ world record low barometric pressure for a land station of 911 @. @ 9 hPa (26 @. @ 93 inHg) was observed in Muroto . Though surpassed less than a year later during the 1935 Labor Day hurricane in the Florida Keys , it remains the lowest value ever observed in mainland Japan and the third @-@ lowest throughout the country . It briefly emerged over the Kii Channel before striking the Kaifu District in Tokushima Prefecture . The system then crossed the Kii Channel again and traversed Awaji Island . After another brief stint over water , the storm made its next landfall directly over Kobe , Hy?go Prefecture , just 30 km (19 mi) west of Osaka City . A barometric pressure of 954 @. @ 3 hPa (28 @. @ 18 inHg) was observed in Osaka . Crossing mainland Japan , the storm briefly emerged over the Sea of Japan before traversing northern Honshu .

Pronounced frontal features , a characteristic of extratropical cyclones , developed late on September 21 , with a cold front extending south toward the Philippines . The system continued on an easterly course and was last noted in the International Best Track Archive on September 22 moving away from Hokkaido . Surface weather analyses depict the system continuing east , crossing the International Date Line (180 °) by September 23 . During this time , its central pressure rose to roughly 985 ? 990 mbar (hPa ; 29 @. @ 09 ? 29 @. @ 34 inHg) . On September 24 , the storm turned north toward the Aleutian Islands of the then Territory of Alaska and deepened . Winds up to Force 10 ? 89 to 102 km / h (55 to 63 mph) ? on the Beaufort scale affected parts of the Aleutians and a pressure of 964 mbar (hPa ; 28 @. @ 47 inHg) was observed near 48 ° N 160 @. @ 5 ° W ? / 48 ; -160.5 . Traversing the Bering Sea , the system was last identifiable on September 25 over western Alaska .

= = Impact = =

Called the " second @-@ greatest catastrophe of modern Japan " , and the " worst typhoon in a generation " , the storm wrought tremendous damage in Shikoku and southern Honshu , with areas in and around Osaka suffering the brunt of its impact . The effects , at the time , were second only to the 1923 Great Kant? earthquake . Throughout Japan , 3 @,@ 066 people were killed , of which at least 1 @,@ 665 deaths were in Osaka Prefecture , and 13 @,@ 184 others were injured . This ranked it as the deadliest typhoon in Japanese history , until Typhoon Vera in 1959 which killed approximately 5 @,@ 000 people . A total of 34 @,@ 262 buildings were destroyed , another 40 @,@ 274 were severely damaged , and 401 @,@ 157 were flooded or affected . Total damage far exceeded \$ 300 million (1934 USD) . Approximately 200 @,@ 000 people were rendered homeless in Osaka , and at least 250 @,@ 000 required assistance .

In K?chi Prefecture , where the storm first made landfall , powerful wind gusts ? measured up to 234 km / h (145 mph) ? caused tremendous damage . Torrential rain accompanied the storm , amounting to 684 mm (26 @.@ 9 in) in Muroto . Throughout K?chi , 1 @,@ 815 homes were destroyed and 6 @,@ 064 were damaged or flooded ; 81 people died and 399 more sustained injuries . Sixty @-@ three people died in Muroto when the typhoon 's storm surge swept away 550 homes .

The greatest damage , however , took place across eastern Osaka Bay . A maximum tide of 3 @.@ 1 to 4 @.@ 2 m (10 to 14 ft) was observed there , the highest ever for the region . Areas up to 8 km (5 @.@ 0 mi) inland were inundated by the typhoon 's storm surge , total of 49 @.@ 31 km2 (19 @.@ 04 mi2) of the city was flooded . The city of Osaka was crippled by the typhoon , electricity was completely lost , the water supply network sustained significant damage , and communications were disrupted . Powerful winds devastated the city 's poorly built schools , destroying 128 buildings . Within them , at least 421 children and teachers were killed , while 1 @,@ 100 others sustained injury . One teacher , Masuji Ashida , was hailed as a hero for sacrificing himself to save his students by propping up the exit of his collapsing classroom with his own body ; his students escaped before he was crushed under the weight of the building . An insane asylum along the city 's outskirts was swept away with 60 patients missing . A five @-@ story pagoda (built in 1812) at the Shiten? @-@ ji temple collapsed , killing 3 people and trapping 20 others . The Sotojima hospital for leprosy was destroyed ; 260 patients are believed to have drowned after the building collapsed amid rising water and gale @-@ force winds . Near ?tsu , a passenger train derailed , killing 10 people and injuring 165 .

The city 's industrial sector sustained severe losses , exceeding US \$ 90 million . More than 3 @,@ 000 factories were destroyed and thousands more were damaged . The Japanese Army 's munitions program was significantly setback due to destroyed ammunition factories . At least 100 people drowned in the city 's harbor where more than 1 @,@ 600 seagoing craft were grounded , sunk , or otherwise damaged .

Thirty of the nation 's then forty @-@ six prefectures were impacted by the typhoon . Significant damage took place in Aichi , Gifu , Kyoto , Nagano , Nagasaki , Tokushima , Tottori , Wakayama , and Yamanashi prefectures . In Kyoto , at least 209 people were killed and 858 were injured .

= = Aftermath = =

Immediately following the typhoon 's tremendous impact , the Japanese military was deployed to Osaka before nightfall on September 21 and water was being trucked in . Officials in Osaka Prefecture released an immediate ¥ 10 million in relief funds . Baron Kischizaemon Sumitomo donated ¥ 1 million (US \$ 300 @,@ 000) to relief funds , the largest such private donation in the nation 's history at the time . The Cabinet of Japan held a special meeting to discuss emergency operations . Three destroyers from the Kure Naval District , loaded with medical equipment and other essentials , were deployed to assist in relief work . Outbreaks of typhoid fever , dysentery , and scarlet fever plagued survivors in the storm 's aftermath .

During an October 5 cabinet meeting , Minister of Education Genji Matsuda recommended schools

to be built with steel in light of the large number of children killed . Reconstruction of the affected areas required an estimated 100 @, @ 000 tons of steel . The National Diet held a special meeting in November to address issues regarding the typhoon 's aftermath .

Following the disaster , a marked increase in actions and countermeasures to storm surge events and typhoons were enacted . Throughout Osaka , construction of breakwaters and embankments alleviated flood risks in coastal communities , reducing the risk of life from roughly 10 ? 3 to 10 ? 7 by the time of Typhoon Nancy in 1961 . Before the onset of World War II , total anti @-@ flood construction in Osaka spanned 36 @.@ 68 km (22 @.@ 79 mi) ; this included 16 @.@ 52 km (10 @.@ 27 mi) along rivers and canals , 11 @.@ 08 km (6 @.@ 88 mi) of levees , and 11 @.@ 08 km (6 @.@ 88 mi) of breakwaters . These protected the city from surges of 3 @.@ 5 m (11 ft) above Osaka Port . Several other projects to expand and rebuild the anti @-@ flood system took place in the decades following World War II .

According to a 2010 report by the Central Disaster Prevention Council , if a storm identical to the 1934 Muroto typhoon were to strike in the modern day , it would kill approximately 7 @,@ 600 people .