= Typhoon Dolphin (2015) =

Typhoon Dolphin was a powerful tropical cyclone that produced the first typhoon @-@ force winds on Guam since Typhoon Pongsona in 2002 . The seventh named storm of the 2015 Pacific typhoon season , Dolphin formed on May 6 in the vicinity of the Federated States of Micronesia (FSM) . Moving eastward at first , the storm slowly organized before beginning a north and west @-@ northwest trajectory . Dolphin intensified into a typhoon before passing between Guam and Rota on May 15 , producing typhoon @-@ force winds on both islands . It later rapidly intensified as it curved to the north . The American @-@ based Joint Typhoon Warning Center (JTWC) designated Dolphin as a super typhoon , while the Japan Meteorological Agency (JMA) estimated 10 minute sustained winds of 185 km / h (115 mph) . Dolphin turned to the northeast and weakened , becoming extratropical on May 20 and exiting the western Pacific basin on May 24 .

The storm first affected the FSM , notably Pohnpei where it dropped 603 mm (23 @.@ 73 in) of rainfall over three days . The rains and gusty winds knocked down many trees on the island , one of which killed a person , and causing $ 1 million in damage (2015 USD) . Dolphin passed between Guam and Rota , producing gusts of 171 km / h (106 mph) at Andersen Air Force Base on northern Guam . The winds left 40 % of the island without power and left at least 3 @,@ 300 people without water . The storm also dropped heavy rainfall , flooding Guam Memorial Hospital . Dolphin damaged 390 houses , including nine that were destroyed , leaving 1 @,@ 055 people homeless . With damage estimated at around $ 10 million , the island was declared a disaster area . The typhoon also brushed Rota , causing $ 2 @.@ 5 million in damage there , as well as Saipan .

= = Meteorological history = =

The origins of Dolphin were related to a strong westerly wind burst that also led to the formation of previous Typhoon Noul . Early on May 5 , the Joint Typhoon Warning Center (JTWC) began monitoring an area of deep convection approximately 300 km (185 mi) southwest of Pohnpei . It had a poorly @-@ defined circulation and broad rainbands , while low to moderate wind shear and warm sea surface temperatures favored development . The convection quickly became better organized and more concentrated around the broad center , aided by increased outflow . The Japan Meteorological Agency (JMA) classified the system as a tropical depression at 06 : 00 UTC on May 6 about 325 km (200 mi) southwest of Pohnpei . At 21 : 00 UTC that day , the Joint Typhoon Warning Center (JTWC) also began issuing advisories on the system , classifying it as Tropical Depression 07W .

After its formation , the depression moved slowly with the low @-@ level flow , in what the JTWC described as an " atypical eastward direction " . Wind shear in the region exposed the convection from the circulation early on May 7 , although the thunderstorms increased the next day , mostly in the storm 's northwest quadrant . A building subtropical ridge turned the system more to the north . By May 8 , the depression organized enough for the JTWC to upgrade it to a tropical storm . At 12 : 00 UTC on the next day , the JMA followed suit and upgraded the depression to Tropical Storm Dolphin . By that time , the system had developed rainbands spiraling around the circulation , although continued wind shear left the center exposed . Around that time , Dolphin passed about 80 km (50 mi) west of Kosrae in the Federated States of Micronesia (FSM) , and over the next few days it passed near other small islands in the region . Despite the sheared structure , the storm developed an eye feature on May 11 , indicative of further strengthening , while the storm was passing 285 km (180 mi) east of Pohnpei . That day , the shear began to decrease , allowing the outflow to improve and convection to blossom . Early on May 12 , the JMA upgraded Dolphin to a severe tropical storm , estimating 10 minute winds of 95 km / h (60 mph) .

On May 12 , Dolphin began moving steadily to the west @-@ northwest . It developed a persistent central dense overcast over the center as conditions became increasingly favorable . At 00 : 00 UTC , the JMA and JTWC both upgraded Dolphin to typhoon status , based on a developing eye feature . The eye , initially only 9 km (6 mi) in diameter , became more defined in the center of the convection . The intensification trend was soon halted by a combination of moderate southerly wind

shear and dry air from the west , causing the eye to become obscured on conventional satellite imagery . On May 15 , the wind shear once again lessened . The compact core persisted during this time , although the center was slightly obscured . As the typhoon approached Guam , radar imagery tracked the eye underneath the deepest convection . Late on May 15 , Dolphin passed between Guam and Rota , bringing its eyewall over both islands .

After leaving the Marianas Islands , the eye of Dolphin became much larger as the storm developed strong outflow channels , both indicative of further strengthening . On May 16 , the typhoon began rapid deepening as it reached the western periphery of the ridge , causing it to turn more to the north . At 06 : 00 UTC that day , the JMA estimated peak 10 minute winds of 185 km / h (115 mph) . Based on the well @-@ defined structure and Dvorak ratings of T7.0 , the JTWC upgraded Dolphin to a super typhoon late on May 16 with 1 minute winds of 260 km / h (160 mph) . The approaching westerlies turned Dolphin to the north and northeast on May 17 while also imparting unfavorable conditions , causing the eye and the convection to elongate and weaken . By May 18 , increased wind shear had exposed the circulation as the winds continued to drop . After the convection decreased further , the JTWC discontinued advisories on Dolphin on May 19 , once Dolphin was beginning to become extratropical near the Japanese island of Iwo Jima . On the next day , the winds fell below typhoon force , and at 00 : 00 UTC on May 21 , the JMA declared Dolphin extratropical . The storm accelerated to the northeast , passing through the Aleutian Islands on May 22 . The storm slowed once reaching the Gulf of Alaska , turning eastward to cross the International Date Line on May 24 .

= = Preparations , impact , and aftermath = =

Early in Dolphin 's duration , it moved through the eastern FSM . On Kosrae , winds peaked at 60 km / h (37 mph) . Later , the outer rainbands affected Pohnpei , producing a gust of 88 km / h (55 mph) , as well as heavy rainfall . Over three days , the precipitation reached 603 mm (23 @.@ 73 in) of rainfall over three days , including 388 mm (15 @.@ 26 in) in one day . This accounted for about one @-@ third of Pohnpei 's record monthly rainfall total of 1 @,@ 109 mm (43 @.@ 68 in) for May 2015 . The high winds downed hundreds of trees , some of which fell onto cars and homes , and killed one person . One family in Palikir needed medical attention when a tree fell onto their house . Residents lost power and water access for up to two weeks . Many houses had damage to roofs , and about 200 homes on Pohnpei were damaged or destroyed . Crops also sustained damage from high waves causing salt intrusion , affecting taro patches . Damage in the FSM was estimated at $ 1 million . In response to the damage , the FSM government declared Pohnpei as a state of emergency on June 8 . The typhoon 's westerly winds produced a swell that affected the Marshall Islands , sinking several boats in Kwajalein Atoll .

In preparation for the cyclone , schools , businesses , and public transit were closed on Guam . The Federal Emergency Management Agency (FEMA) deployed approximately 15 representatives to the island to mitigate the response time in the wake of the storm . Eight schools were opened as shelters , and more than 1 @,@ 000 residents sought refuge during the height of the storm . Additional shelters were opened on the islands of Rota , Tinian , and Saipan in the Northern Mariana Islands (CNMI) , and nearly 200 people sought cover there . Airports and seaports between the three islands were shut down , causing flights to be canceled . Earlier in 2015 , the Guam Weather Forecast Office created a Facebook page to help inform residents about typhoons ; during Dolphin , the page received over 425 @,@ 000 views .

Passing just north of Guam , Dolphin produced the first typhoon @-@ force winds on the island since 2002 during Typhoon Pongsona . Andersen Air Force Base recorded sustained winds of 135 km / h (84 mph) , while gusts reached 171 km / h (106 mph) . In the central portion of the island , the NWS office recorded gusts of 130 km / h (81 mph) . The storm dropped torrential rainfall during its passage , reaching over 460 mm (18 in) at Andersen Air Force Base , of which 240 mm (9 @.@ 3 in) fell within a 12 @-@ hour period . Wave heights offshore Guam topped 6 @.@ 1 m (20 ft) . On Guam , the heavy rainfall caused flooding in areas lacking proper drainage . The Guam Memorial Hospital sustained about $ 1 million in damage from storm @-@ related flooding . High

winds left about 40 % of Guam without power , mostly in the north and central portions of the island , although the outages were fixed within a few days . The power outages also disrupted generators for water wells , leaving 3 @,@ 300 people without access to clean water ; residents in some areas were under a boil @-@ water advisory . Utility damage was estimated at $ 3 million . Businesses sustained $ 1 @.@ 9 million in damage . Dolphin also caused $ 1 @.@ 2 million worth of crop damage . The typhoon damaged over 7 @,@ 000 banana trees as well as 39 of the endangered ironwood trees . Rough waves sank a boat at Apra Harbor , requiring workers to clean oil that escaped from the damaged vessel . Dolphin damaged 390 houses across Guam , of which 9 were destroyed and another 55 were severely damaged . This left 1 @,@ 055 people homeless , mostly in the towns of Yigo or Dededo . Overall damage was estimated at nearly $ 10 million , prompting Governor Eddie Calvo to declare a state of emergency . On June 5 , President Barack Obama signed a major disaster declaration for the territory , allowing for federal aid to be used . Ultimately , the government provided about $ 4 @.@ 7 million in aid , mostly in public assistance . A federal grant provided 220 temporary jobs toward cleaning and repairing damage .

On Rota to the north of Guam , Dolphin produced the first typhoon @-@ force winds since 2004 during Chaba . The storm damaged many homes on the island . High winds knocked down trees and power lines , causing an island @-@ wide power outage . Damage on Rota was estimated at $ 2 @.@ 5 million . Continued high waves from the typhoon caused difficult conditions for ships trying to bring supplies to the country , after store supplies began running out . Workers quickly repaired the power outages and cleared roads of any storm debris . The government of the CNMI declared Rota a disaster area , meaning emergency funds could be allocated toward relief and reconstruction . On Saipan to the north of Rota , wind gusts reached 101 km / h (63 mph) , while rainfall totaled 89 mm (3 @.@ 5 in) .

The remnants of Dolphin , in conjunction with previous Typhoon Noul , shifted the broader weather pattern to bring record warmth to Alaska , making the temperatures warmer than that of Washington , D.C ..