



CENTRAL PACIFIC HURRICANE CENTER TROPICAL CYCLONE REPORT

TROPICAL CYCLONES 1957



Central Pacific Hurricane Center

The tropical cyclone summaries for the years between 1832 and 1979 were taken from A History of Tropical Cyclones In the Central North Pacific and the Hawaiian Islands 1832-1979. This Department of Commerce publication was printed in 1981 and authored by Samuel Shaw of the Central Pacific Hurricane Center (CPHC) and the National Weather Service Forecast Office in Honolulu, Hawaii.

The following are excerpts from U.S. Weather Bureau Climatological Data records by David I. Blumenstock, Weather Bureau Climatologist for the Territory of Hawaii at that time.

From the Weather Summary for Hawaii - August 1957:

"The most remarkable weather events of the month were the appearance in the general area of the Hawaiian Islands of two tropical storms, each of which later developed into a full-fledged hurricane. Since there was a tropical storm in Hawaiian waters during July also, this brought to three the total number of such storms thus far. And since even one identifiable tropical storm during the year is a most unusual event in this area, the present season has most certainly been outstanding in this respect. It is noteworthy that at the same time the number of tropical storms and typhoons in the Western Pacific has been running decidedly below average. It seems likely that this inverse correlation is more than merely coincidental, although the circulation anomalies that would account for such a correlation have not been identified."

And, from the Weather Summary for Hawaii - September 1957

"The most striking feature of the weather of September in the area of the Hawaiian Islands was the continual appearance of tropical storms. Such storms, which have been relatively

abundant this past summer, are very unusual so far to the west of Mexico and so far to the east of the Marianas and Caroline Islands. Of the three tropical storms of the month, only one developed into a true hurricane with winds above 65 knots."

JULY 14 - 26, (HURRICANE KANOA)

The tropical cyclone that eventually became hurricane KANO was first announced in a bulletin issued by the San Francisco Weather Bureau Office at 0700 GMT, July 15, 1957. The bulletin based largely on a message from the S.S. GARVEL PARK which reported a westerly wind of 45 knots and a pressure of 998 millibars (29.47") at 2000 GMT, July 14, placed the center about 75 miles southwest of Manzanillo, Mexico. The San Francisco office continued issuing bulletins based on forecasts of wester movement at 10 knots until July 18 when lack of data forced abandonment.

However, at 0300 GMT July 21, the ship CAPE HORN near 15N 130W reported 67 m.p.h. winds and very high seas with precipitous swells. The San Francisco office then resumed advisories, upgrading the storm to a hurricane, the CAPE HORN remained near the periphery of the storm for the following four days rendering invaluable aid in charting its course and intensity.

On July 22 an aircraft from the 57th Weather Reconnaissance Squadron, Hickam Air Force Base, Oahu, observed the hurricane's eye as 40 miles in diameter and estimated its maximum sustained winds at 70 knots with gusts to 100 knots at 17.4N 138.4W. The next day the ship ELBA sent valuable reports that were extremely helpful in analysis of the situation. Air Force reconnaissance continued daily until the storm filled and winds dropped below 35 knots.

Normally, data southeast of Hawaii before the advent of , meteorological satellites were conspicuous by their virtual absence. However, this hurricane traveled nearly the same path as the shipping lane between the Panama Canal and Hawaii. This coincidence allowed enough data to permit excellent forecasts of the storm's movement and character.

As the hurricane neared the 140th west meridian the San Francisco office transferred advisory responsibility to the Weather Bureau in Honolulu. The Hawaiian military meteorological offices, responsible for slightly different areas than the Weather Bureau, had already begun issuing their warnings and had named the storm KANOA, a Hawaiian name meaning loosely "the free one."

As KANOA approached the 145th meridian it became apparent that there would be little or no chance for recurvature, as the semi-permanent Pacific High was strengthening to the north and ridging further westward. An effective block to any appreciable northward movement had formed at least in the lower layers, and KANOA headed for Hawaii. A Low then formed aloft just northeast of the Islands and was later reinforced by colder air from a trough extending southward from the Aleutians.

With the lower level pattern forcing the storm mainly westward but with the upper air analysis suggesting that colder air would alter the storm's characteristics, KANOA was due for a change. It weakened steadily, and the portion above 10,000 feet was incorporated into the cold trough. By July 23 the storm at 700 millibars was only part of a broad trough in the easterlies which had several lesser but distinct closed circulations. The part below 10,000 ft. was caught in the trade wind flow and continued its westward movement, weakening rapidly. By the time it

reached the Hawaiian Islands it was merely a perturbation in the trades. However, as is often the case with similar vortexes or perturbations, it caused a marked and beneficial increase in rainfall over the State, though the rain fell in a nearly normal trade wind pattern with the heavier amounts being reported on the Big Island, Maui, and Kauai.

AUGUST 6-15, (UNNAMED HURRICANE)

At 1800Z on August 5, 10 days after the demise of KANOA, a closed low pressure center was indicated near 18.0N 125.7W by a report from the S.S. STEEL ADVOCATE.

By 0000Z of the 6th the STEEL ADVOCATE, steaming on an easterly course and positioned at 18.5N 125.6W, was reporting significant weather changes and maximum surface winds of 50 knots. The Fleet Weather Facility, Alameda, immediately issued a tropical storm bulletin.

The first report accurately determining the position and intensity of the storm came from the S.S. STEEL FLYER, which passed through or very near the center at 1815Z of the 6th, reporting the center at 18.44N 129.7W with an observed wind force of Beaufort 8 to 9.

The first aircraft report of the center was at 20.7N 135.6W at 2048Z on 7 August. That fix's accuracy is in doubt since at 07/2214Z and again at 08/000Z, the storm was located by the same aircraft at 20.6N 135.4W and at 21.0N 135.8W respectively. The minimum sea level pressure was reported at 993.9 mb (29.35") at 08/0010Z with maximum estimated surface winds of 60 knots 50 miles northeast of the center. The speed of movement was 12 knots, toward the west-northwest.

During the next 47 hours the storm was not reconnoitered on account of the unavailability of aircraft and it was subjectively downgraded to a tropical depression. During this interval the average speed of advance was 17 knots; it is possible that the storm moved faster for part of that time. The storm's track was then parallel to and approximately 250 miles north of that taken about two weeks earlier by KANOA.

Considerable filling was indicated by a central pressure of 1004 mb (29.65") at 09/2315Z, a 10 mb increase over that observed at 08/0100Z. The central pressure at 10/2015Z was only 1000 mb (29.53") so it is likely that it was already falling by 09/2315Z.

At 10/0000Z this system was once more designated a tropical storm, with maximum surface winds of 45 knots in the northwest quadrant. For the first time a closed circulation was found at 500 mb.

At 10/2015Z an aircraft reported maximum winds southwest of the center at 65 knots. The same aircraft fixed the eye again at 10/2345Z and reported the maximum wind to be 75 knots in the south-southwest quadrant. The first hurricane advisory was issued at 11/0000Z.

This hurricane, which was never named, continued moving generally toward the west-northwest at an average speed of 11 knots for about 24 hours. During this time the maximum reported surface wind was 65 knots, the minimum sea level pressure remained at 1000 mb and the radius of 50 knot winds estimated at 60 miles.

The 12/0000Z bulletin reduced the system once again to a tropical storm with maximum winds of 60 knots and forecast continued northwestward movement at 11 knots. This forecast

was verified by the 12/2110Z aircraft fix placing the storm at 34.2N 162.0W and reporting estimated surface winds of 50 to 55 knots with a minimum sea level pressure of 987 mb (29.1511). At 13/1800Z the ship JEAN LAFITE reported winds of 90 knots, sea level pressure of 999.0 mb (29.50), and a 3-hour pressure tendency of plus 6.8 mb at 35.3N 166.6W.

Redesignated a hurricane, the storm began to recurve at approximately that time 0 It reached the westernmost position of its track, 39.0N 171.3W at 0000Z of the 15th. During recurvature the circulation weakened, decreased to below hurricane intensity shortly after 14/1800Z, and became extratropical.

Throughout the life of this storm there was probably a good correlation between the intensity of the surface circulation and the varying height of the 200 mb isobaric surface. Intensifying and weakening seem to have been associated respectively with the passage of the circulation below ridges and troughs in the 200 mb surface. The most notable example of this phenomenon occurred during the period 11/0000Z to 15/0000Z. On the 10th, the storm was proceeding toward the northwest under the axis of a weak trough at 200 mb. It then had maximum surface winds of 75 knots. By 12/0000Z the circulation had moved under a closed 200 mb low center with the surface winds decreasing to 60 knots. Maximum winds were down to 50 knots by 12/1800Z. Movement was such that the disturbance continued under the low aloft until sometime after 13/0000Z when it began to approach a 200 mb ridge. When the storm passed below this ridge between 13/1200Z and 14/0000Z its surface winds had increased to 90 knots and its forward motion had decreased to 11 knots. Under the next 200 mb trough it recurved, weakened, and speeded up. By 15/0000Z the surface winds had decreased to 60 knots and the storm was heading north at 13 to 15 knots.

At 0815 GMT on the 15th the following message was received from the CONSTITUTION STATE:

CONSTITUTION STATE/WSBG CKNC 150815 GMT ON COURSE 264 TRUE AT APPROX 142300Z CROSSED AN ESTIMATED 20 MILES AHEAD OF CENTER OF STORM PATH X MAXIMUM WINDS OBSERVED FORCE 9 X LIGHT RAINS ONLY X SE SWELLS 20 TO 25 FEET X MINIMUM VISIBILITY X 3 MILES X WINDS FOLLOWING classic CYCLONIC PATTERN BACKING RAPIDLY AND DIMINISHING AFTER PASSING INTO LEFT SEMICIRCLE

Post analysis of other synoptic features during the life of this storm indicated interesting sea surface temperature and 700 mb height anomalies.

Since the storm passed over shipping lanes between the west coast of North America and Hawaii and between Japan and the United States, enough surface data were obtained for a good analysis of the associated sea surface temperature pattern. The maximum deviation (plus 5 to 7 . 5 F) from normal temperature occurred in the direction of movement of the storm. These data indicated, perhaps coincidentally, that the storm's movement had been roughly parallel to the major axis of the positive temperature anomaly.

At 700 mb, height anomalies for the month July and August 1987 were considerably positive from 22N to 35N from about 160W eastward into North America. The Pacific high cell north of Hawaii was larger than normal and displaced eastward. The usual north-south trough off the west coast of California and Mexico was weak and a narrow but well-defined east- west ridge

appeared from southern Arizona across northern Baja California to 28N 125W, then curving northwestward to the high cell northeast of Hawaii.

SEPTEMBER 1-17, (HURRICANE/TYPHOON DELLA)

The earliest indications of the tropical disturbance that became hurricane/typhoon DELLA were observed on September 1 and 2 when reports from the Hawaiian area indicated the possibility of a closed circulation south of Honolulu.

DELLA's origin is obscure. It is believed that this system became a tropical storm during late August in the area of few ship reports south and east of Hawaii much as hurricane SUSAN suddenly strengthened into a tropical storm from a development on the Intertropical Convergence Zone in October 1978.

The first precise information concerning the location and intensity of the storm was received on the 3rd of September when the EPPING FOREST reported winds of 84 knots and fixed the eye twice by radar, once at 04/0300Z near 22N 163.3W and again at 04/0745Z near 22N 164.5W, about 300 miles west of Kauai. Based upon these reports the storm was named hurricane DELLA.

Simultaneously there was very heavy surf on southern Kauai, the breakers reaching 16 feet at Nawiliwili. At the same time over Johnston Island there was a sharp drop in the height of the 500 mb surface.

DELLA set course almost directly for French Frigate Shoals, then inhabited only by men of the U.S. Coast Guard Loran Station. The weather ship USCGC MATAGORDA returning to Honolulu from ocean station VICTOR was diverted to stand by French Frigate Shoals in case of an emergency.

DELLA's eye passed 10 miles south of French Frigate Shoals at 04/1600Z with maximum winds of 71 knots gusting to 95 knots. The minimum reported sea level pressure at the Loran was 980.7 mb (28.96").

Damage there was minor since the hurricane was still relatively small and the seas had not yet built up. The MATAGORDA was within 100 miles at that time and experienced little or no effect from the hurricane.

The first reconnaissance aircraft fix on DELLA was made at 04/1929Z, locating the eye just west of French Frigate Shoals near 24.1N 167.2W.

DELLA then made a feint towards Midway Island but just before reaching 175W abruptly moved southwestward and crossed the International Date Line at 20N on September 9, at which time the hurricane designation was changed to typhoon.

After entering the western Pacific, DELLA flirted with Wake Island but passed a safe distance to the north and continued on west-northwestward past Marcus Island to near 28N 155E, where sharp recurvature took place.

At 1200 GMT on the 15th, an Air Force reconnaissance plane fixed the typhoon's position at 33.7N 55.7E, approximately 200 miles southwest of Pacific Ocean Station VICTOR. A later

report placed DELLA just 120 miles away and the plane radioed to Station VICTOR that DELLA was headed its way. The weather ship stationed at VICTOR, the USCGC BERING STRAIT, had 3 hours advance warning to take necessary precautions for safety of ship and personnel. The following account by Fred Price, U.S. Weather Bureau observer in charge on the BERING STRAIT, describes what subsequently took place:

"DELLA came upon us suddenly. She was traveling so rapidly the sea had little chance to build up before her. Dawn brought a grayish-white seascape with little differentiation between sea and air. An occasional 40-foot wave was observed, but the tops were blown off almost as soon as they formed. Excellent ship handling kept the vessel rolling and pitching to a minimum; thus making it possible to keep all observational schedules including one radiosonde flight. The wind and sea abated rapidly by afternoon."

First Assistant Frank Johnson and Jack Nunan were planning to make meteorological history. They had three full tanks of helium on the line to inflate balloons, two radiosondes checked and ready for flight, and all radio receiving gear in top shape for making a radiosonde release in the very center of a typhoon. But alas, the eye of the capricious DELLA passed 30 miles to the northwest of station VICTOR. The radiosonde release at 0000 GMT 16 September was made with winds blowing over 60 knots. The fourth weatherman aboard, Kiyoto Endo, said the highest 1-minute wind speed was logged at 97 knots during the storm passage. Before the radiosonde release, at 15/2018Z, VICTOR reported a minimum sea level pressure of 995 mb (29.3811) with a maximum observed surface wind of 80 knots from 230 degrees at 15/2100Z.

Soon after the passage of DELLA, radio-central aboard the BERING STRAIT intercepted a distress call from the Liberian freighter CYGNET. This vessel had been buffeted severely by DELLA and had suffered both structural damage and crew injuries. A large wave had carried away part of the bridge.

After 36 hours of search the BERING STRAIT was able to put its Public Health Service doctor aboard the CYGNET. He attended the injured and also found the captain, with a bad heart, in a state of near collapse after having spent a continuous 36-hour watch on the bridge.

This done, the BERING STRAIT headed back to station VICTOR. About 12 hours later the CYGNET again sent a distress message saying that she had developed a list and with the approach of a second typhoon, CARMEN, was in danger of capsizing. The cutter returned to the stricken vessel and put a damage control party on board to help trim it. The Coast Guardsmen stood by until CARMEN was no longer a threat.

DELLA, after her encounter with the CYGNET, continued northeastward, accelerated, and decreased in intensity on 17 September shortly before crossing the International Date Line a second time.

DELLA, as a hurricane and typhoon, traversed a distance of more than 5000 miles before becoming an extratropical storm. It was not until 21 years later that another storm which also had a history of hurricane intensity in the Central North Pacific and near Hawaii, hurricane FICO in 1978, would be able to claim a track distance of 5000 miles.

SEPTEMBER 8-11, UNNAMED TROPICAL STORM

The second tropical storm of the month in the Central North Pacific was first recognized near 15N 140W on the 8th, on the basis of a ship report. This storm continued to move slowly towards the west-northwest, its estimated position being 18N 146W on the 11th. Thereafter, it entered an area where there were no observations and failed to reappear.

SEPTEMBER 25-28, UNNAMED TROPICAL STORM

The third and last cyclone of the month appeared near 12N 163W on the 25th and like its predecessor disappeared after few days. Its last estimated position was 12N 175W on the 28th.

At this time it appears appropriate to mention a currently (1980) noted observation of Prof. James C. Sadler of the University of Hawaii that "It seems that cyclones and developing disturbances have a tendency to form further west during the latter part of active tropical cyclone seasons in the Central North Pacific." The aforementioned occurrences, as well as the subsequent development of NINA in 1957, support Sadler's hypothesis. Conversely, analysis of tropical cyclones in the Western North Pacific show that, at least during 1957, late season storms formed farther east.

NOVEMBER 29 - DECEMBER 7, (HURRICANE NINA)

Forecasters at Honolulu probably thought that the very active tropical cyclone season of 1957 was "all pau" by the end of November when open ocean swell from a winter storm which traversed the northern Central Pacific caused damaging 30-foot surf along the north shore of Oahu on the 27th and heavy rains accompanied the passage of a cold front on the last two days of the month.

But, at the same time the cold front was entering the islands, indications of a tropical cyclone far south of the Islands were received. At 1800Z on November 29 the cooperative weather station on Palmyra Island, manned by personnel of Scripps Institution, reported southwesterly surface winds of 46 knots, surface pressure of 1002.7 mb (29.61") and stated in plain language, "maximum wind velocity during night 62 knots." Palmyra reports irregularly. The report prior to the 29/1800Z observation, at 29/0000Z, indicated a gentle southerly wind, pressure 1004.7 mb (29.6711) and a 3-hr pressure tendency of minus 3.2 mb. Initial analysis of that report had attributed the pressure tendency report to error or slightly greater than normal diurnal fall. Post analysis showed that tendency to be correct and an indication of cyclone development.

The development was in the Intertropical Convergence Zone which had been near Palmyra for a week. There was a weakness, but no troughing in the easterlies, 300 miles east of Palmyra.

Warnings of a tropical storm named NINA were issued immediately after receipt of the 291800Z report from Palmyra; the center was assumed to be nearly stationary since Palmyra's weather continued squally and pressure subnormal. However, at 30/1815Z an aircraft from the 57th Air Force Reconnaissance Squadron at Hickam AFB found the center at 14.4N 161.3W, some 500 miles north of Palmyra, and established that it had intensified to hurricane force. The western islands of the Hawaiian chain were alerted to the probability of hurricane winds. After another 6 hours had passed the center's forward motion slowed abruptly from 20 knots to 6 knots while changing direction from north-northeast to north, toward Kauai.

Very early on December 2 it changed course to move northnorthwest and about 12 hours later when at 22N it turned very sharply to the west. Thereafter, it continued in a westerly direction until the 5th to a point near 20N 173W.

A polar high pressure system moved eastward off Japan on December 4 and early on the 6th its leading edge commenced resisting NINA's westward movement. Within 20 hours the storm, which was now forced to move nearly due southward, dissipated rapidly as cold air from the high entered its circulation.

At its closest approach to the Hawaiian Islands NINA was centered about 120 miles west-southwest of Kauai. Even at that distance the storm brought heavy rains and floods to Kauai, the highest total being 20.42 inches in 14 hours at Wainiha. The highest wind speed on Kauai was 92 m.p.h. at Kilauea Light on December 1. Honolulu Airport recorded gusts of 82 m.p.h., an all-time record, on the evening of November 30 when NINA's eye was located 300 miles south-southwest of Honolulu. Strong trade winds, which had existed over the entire island chain since NINA was first detected were augmented as the hurricane approached.

On the south coast of Kauai there was very high surf, with heights of 35 feet reported. That surf accounted for most of Kauai's estimated damage of \$100,000.

Of the other major Hawaiian islands only Oahu was strongly influenced by the storm. Moderate rains along with 45 m.p.h. winds occurred there. A City & Country employee was electrocuted on Oahu and a fishing sampan with three persons aboard was lost.

The merchant vessel MARGARITA CHANDRIS was reported in distress west of Kauai during the storm, but later made port. Airlines and surface vessels ceased operation to and from Honolulu during the weekend of November 30-December 1.

Not only was NINA preceded by a cold front, but no sooner had the storm left the Hawaiian area when another cold front passed across Kauai and Oahu -- on December 6. NINA was the fourth late season tropical cyclone in a series of cyclones which began on November 1 with typhoon KIT originating near 5.0N 171.5E, followed by typhoon LOLA on the 6th at 5.5N 173E, then typhoon MAMIE at 5.0 N 173E on the 16th and culminating with NINA.