Tropical Cyclone Report
Hurricane Patricia
20-26 October 2003

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19 December 2003

Patricia, the last tropical cyclone of the 2003 eastern North Pacific season, was a hurricane for about a day. It did not threaten land.

a. Synoptic History

A fairly distinct tropical wave crossed Central America on 17 October and moved into the eastern North Pacific Ocean on 18 October. As the wave moved westward to the south of Mexico over the next couple of days, its associated deep convection become consolidated and organized into curved bands. The system received its first Dvorak classification at 2345 UTC 19 October. It is estimated that a tropical depression formed by 1200 UTC 20 October, centered about 400 n mi south of Acapulco Mexico. Banding features continued to develop in all quadrants of the tropical cyclone, and it quickly strengthened into Tropical Storm Patricia by 1800 UTC 20 October. The "best track" chart of Patricia's path is given in Fig. 1, with the wind and pressure histories shown in Figs. 2 and 3, respectively. The best track positions and intensities are listed in Table 1. Around 1200 UTC 21 October, an eye was apparent on satellite imagery, suggesting that Patricia had become a hurricane. The hurricane reached its estimated peak intensity of 70 kt about 12 hours later. Patricia was embedded in an east-southeasterly steering current to the south of a deep-tropospheric ridge. This caused the tropical cyclone to move west-northwestward at 8 to 12 kt for a few days, roughly parallel to, and well offshore of, the coast of Mexico.

On 22 October, an upper-level trough in the vicinity of the Baja California peninsula created increasing westerly shear over Patricia, which caused the low-level center to become displaced to the west of the main area of deep convection. The system weakened to below hurricane strength by 1200 UTC that day. Patricia continued to weaken until around 1200 UTC 24 October, when the shear apparently relaxed a bit, and the center became embedded within the deep convection again. This resulted in a slight restrengthening of the storm. Later on 24 October, the system turned toward the northwest in response to a weakness in the ridge caused by the trough near Baja California. A final weakening trend also commenced. By 0000 UTC 26 October, the system lost most of its deep convection, and the tropical cyclone was dissipating about 520 n mi south-southwest of Cabo San Lucas. Patricia's remnant low turned westward in response to the near-surface flow, and soon became indistinct.

b. Meteorological Statistics

Observations in Patricia (Figs. 2 and 3) include satellite-based Dvorak technique intensity

estimates from the Tropical Analysis and Forecast Branch (TAFB), the Satellite Analysis Branch (SAB) and the U. S. Air Force Weather Agency (AFWA). Patricia's peak intensity of 70 kt is a little lower than the maximum Dvorak estimates, since subsequent QuikSCAT observations suggest that the former estimate may have been a little on the high side.

c. Casualty and Damage Statistics

There were no reports of damage or casualties associated with Patricia.

d. Forecast and Warning Critique

Average official track errors (with the number of cases in parentheses) for Patricia were 34 (21), 62 (19), 89 (17), 113 (15), 177 (11), 276 (7), and 326 (3) n mi for the 12, 24, 36, 48, 72, 96, and 120 h forecasts, respectively[1]. These errors are slightly lower than the most recent 10-yr averages through 72 h, but somewhat larger than the 2001-2002 averages at 96 and 120 h. However, there were only a few cases at these latter two forecast intervals. The average official track forecasts had a north-northeastward bias. Table 2 shows a comparison of the average official track errors with various guidance models. It should be noted that the 5-day CLIPER (CLP5) forecast errors were lower than the average official errors at all forecast intervals.

Average official intensity errors for Patricia were 9, 16, 21, 26, 30, 29, and 23 kt for the 12, 24, 36, 48, 72, 96, and 120 h forecasts, respectively. For comparison, the average 12 through 72 h official intensity errors over the 10-yr period 1993-2002 are 6, 11, 15, 17, 20 kt, respectively, and the average 96 and 120 h intensity forecasts for 2001-2002 are 18 and 19 kt, respectively. On average, there was a positive bias to the official intensity forecasts at all time intervals.

The north-northeastward track bias and positive intensity bias in the official forecasts were at least in part due to the guidance from the GFDL model, which had a number of forecasts showing Patricia turning toward Mexico and becoming a major hurricane. Clearly, more work needs to be done to improve intensity forecasting by dynamical models.

Watches and/or warnings were not required for Patricia.

[1] All forecast verifications in this report include the depression stage of the cyclone. National Hurricane Center verifications presented in these reports prior to 2003 did not include the depression stage.

Table 1. Best track for Hurricane Patricia, 20-26 October 2003.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
20 / 1200	10.0	100.3	1007	30	tropical depression
20 / 1800	10.3	101.2	1002	35	tropical storm
21 / 0000	10.6	101.9	1000	45	"
21 / 0600	10.9	102.6	994	55	"
21 / 1200	11.3	103.4	987	65	hurricane
21 / 1800	11.6	104.2	987	65	"
22 / 0000	11.7	105.0	984	70	"
22 / 0600	11.9	105.8	987	65	"
22 / 1200	12.0	106.7	990	60	tropical storm
22 / 1800	12.2	107.8	994	55	"
23 / 0000	12.4	108.6	1000	45	"
23 / 0600	12.8	109.5	1002	40	"
23 / 1200	13.2	110.7	1003	40	"
23 / 1800	13.3	111.7	1005	35	"
24 / 0000	13.6	112.3	1005	35	"
24 / 0600	13.7	112.6	1005	35	"
24 / 1200	13.9	112.9	1002	40	"
24 / 1800	14.3	113.2	1002	40	"
25 / 0000	14.6	113.5	1005	35	"
25 / 0600	14.9	113.8	1005	35	"
25 / 1200	15.2	114.1	1008	30	tropical depression
25 / 1800	15.5	114.4	1008	30	"
26 / 0000	15.7	114.7	1008	25	"
26 / 0600	15.8	115.1	1009	20	low
26 / 1200	15.8	115.5	1009	20	"
26 / 1800					dissipated
22 / 0000	11.7	105.0	984	70	minimum pressure

Table 2. Preliminary forecast evaluation (heterogeneous sample) for Hurricane Patricia, 20-26 October 2003. Forecast errors (n mi) are followed by the number of forecasts in parentheses. Errors smaller than the NHC official forecast are shown in bold-face type. Verification includes the depression stage, but does not include the extratropical stage, if any.

Forecast Technique	Forecast Period (h)						
	12	24	36	48	72	96	120
CLP5	**30** (21)	**52** (19)	**74** (17)	**99** (15)	**108** (11)	**89** (7)	**115** (3)
GFNI	40 (15)	75 (13)	117 (11)	175 (9)	315 (5)		
GFDI	47 (19)	86 (17)	122 (15)	165 (13)	275 (9)	344 (5)	629 (1)
GFDL	48 (20)	93 (18)	122 (16)	152 (14)	250 (10)	316 (6)	440 (2)
GFDN	**28** (8)	67 (7)	95 (6)	136 (5)	254 (3)		
LBAR	43 (21)	76 (19)	99 (17)	127 (15)	220 (11)	325 (7)	481 (3)
AVNI	**32** (19)	**51** (17)	**74** (15)	113 (13)	218 (9)	**274** (4)	
AVNO	38 (20)	**56** (18)	**72** (16)	**107** (14)	205 (10)	**269** (4)	
AEMI	36 (12)	**58** (11)	**71** (9)	**87** (8)	**105** (6)	**96** (4)	**83** (1)
BAMD	54 (21)	96 (19)	126 (17)	135 (15)	211 (11)	282 (7)	536 (3)
BAMM	36 (21)	**61** (19)	**76** (17)	**84** (15)	**126** (11)	**126** (7)	**211** (3)
BAMS	41 (21)	75 (19)	114 (17)	151 (15)	230 (11)	297 (7)	**254** (3)
NGPI	38 (18)	63 (16)	89 (14)	117 (12)	**125** (8)	**66** (4)	
NGPS	42 (18)	64 (16)	92 (14)	124 (12)	**152** (8)	**82** (4)	**79** (1)
UKMI	46 (20)	81 (18)	115 (16)	154 (14)	224 (10)	292 (6)	521 (2)
UKM	54 (11)	89 (10)	119 (9)	148 (8)	223 (6)	287 (4)	427 (2)
GUNS	40 (18)	72 (16)	103 (14)	139 (12)	199 (8)	**209** (4)	
GUNA	34 (18)	**59** (16)	**76** (14)	**91** (12)	**116** (8)	**112** (3)	
OFCL	34 (21)	62 (19)	89 (17)	113 (15)	177 (11)	276 (7)	326 (3)
NHC Official (1993-2002 mean)	39 (2864)	72 (2595)	103 (2314)	131 (2050)	186 (1603)	197 (210)	223 (143)

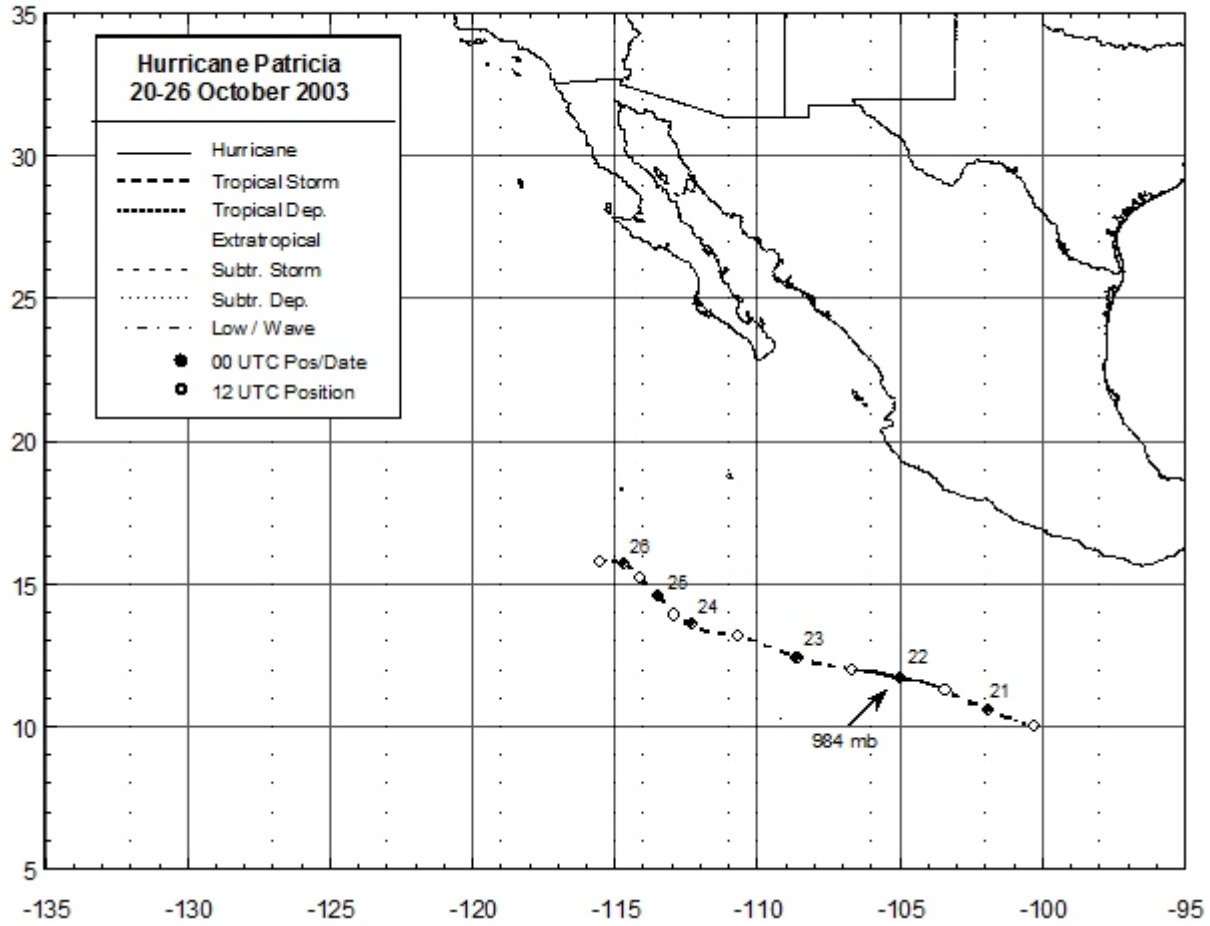

Figure 1. Best track positions for Hurricane Patricia, 20-26 October 2003.

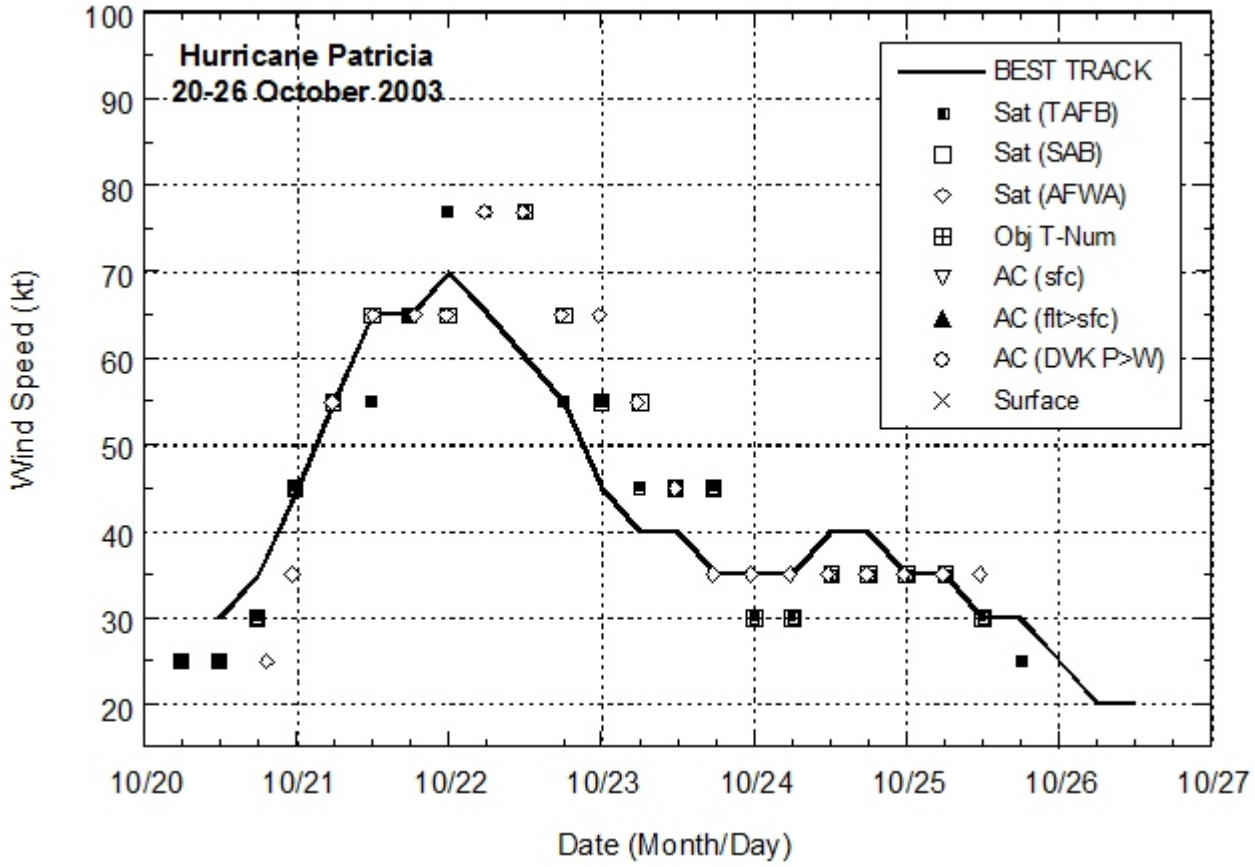

Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Hurricane Patrica, 20-26 October 2003.

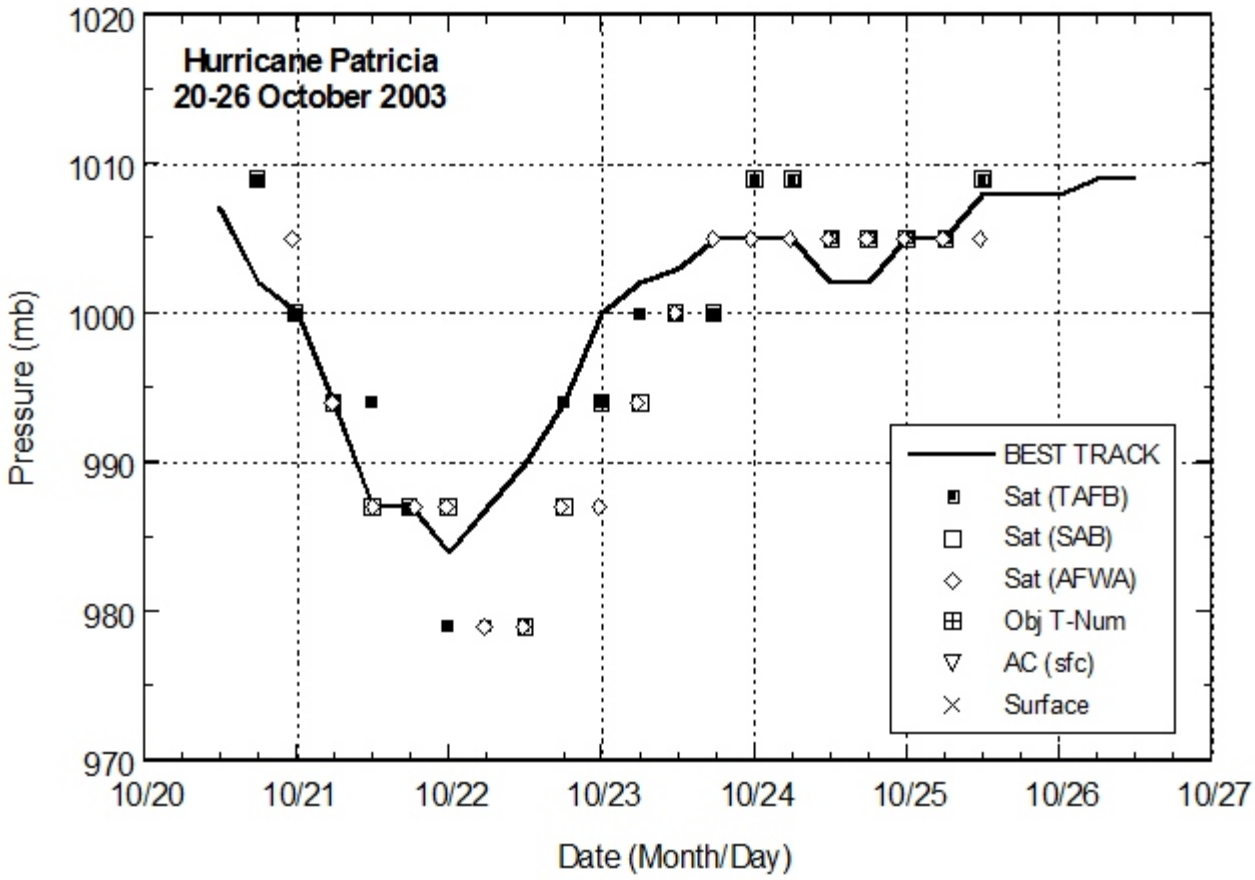

Figure 3. Selected pressure observations and best track minimum central pressure curve for Hurricane Patricia, 20-26 October 2003.