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U.S. National Meteorological Center
U. S. Weather Bureau

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SUMMARY OF VERIFICATION OF NUMERICAL OPERATIONAL TROPICAL CYCLONE FORECAST TRACKS FOR 1963

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Development Branch
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U.S. Joint Numerical Weather Prediction Unit

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INTRODUCTION

The numerical forecast model employed in computing tropical cyclone tracks in 1963 was the same [1] as employed in 1962. An apparently minor error in the procedures of computing the initial analysis of the steering wind data in the region of the tropical cyclone was found and corrected as of 00Z on August 9, 1963. The effects of this error are not known and do not show in the verifications of the 1963 forecasts. All transmitted forecasts that could be verified are included in Tables I, II, III, and IV.

REFERENCE

Vanderman, L. W., 1963: Summary of Verification of Numerical Operational Tropical Cyclone Forecast Tracks for 1962, Technical Memorandum No. 27, National Meteorological Center, U. S. Weather Bureau, January 1963, 12 pages.

TABLE I

HURRICANE FORECASTS (ATLANTIC AND GULF OF MEXICO AREAS)
1963

INITIAL POSITION									
Date	Time	Latitude	Longitude	12 Hours	24 Hours	36 Hours	48 Hours	60 Hours	72 Hours
ARLENE									
8/8	12Z	28.5 N	69.8 W	29	112	297	469	560	
8/9	00Z	29.4	68.5	57	234	475	718		
	12Z	31.4	66.1	87	205	206			
8/10	00Z	34.7	61.5	88	105				
AVERAGE ERROR				65	164	326	594	560	
BEULAH									
8/22	12Z	18.1 N	57.1 W	59	62	57	162	126	268
8/23	12Z	21.0	59.5	67	161	253	314	372	388
8/24	00Z	22.8	59.6	61	109	157	197	266	436
8/25	12Z	26.5	60.5	58	170	388	431	888	1317
8/26	12Z	31.7	59.3	81	106	92	245		
8/27	00Z	34.7	55.2	4	164	318			
	12Z	38.3	52.6	182	348				
AVERAGE ERROR				73	160	211	270	413	602

TABLE I
(Cont'd.)

INITIAL POSITION

Date	Time	Latitude	Longitude	12 Hours	24 Hours	36 Hours	48 Hours	60 Hours	72 Hours
DEBRA									
9/22	00Z	24.1 N	49.8 W	159	323	477	557	485	446
	12Z	25.2	48.8	13	11	41	32	112	
9/23	00Z	26.4	48.1	56	106	165	262		
	12Z	28.3	47.6	25	54	159			
AVERAGE ERROR				63	124	211	284	299	446
EDITH									
9/24	12Z	12.5 N	56.4 W	60	110	201			
9/27	12Z	18.8	69.2	79	141	148	211	264	254
9/28	00Z	20.0	70.7	57	38	65	174	367	
AVERAGE ERROR				65	96	138	193	316	254
FLORA									
10/2	00Z	13.6 N	67.9 W	32	73	128	138	191	168
	12Z	14.6	69.2	12	127	210	266	310	317
10/3	00Z	15.5	70.7	18	42	68	179		
	12Z	16.4	71.9	25	83	186			

TABLE I
(Cont'd.)

INITIAL POSITION									
Date	Time	Latitude	Longitude	12 Hours	24 Hours	36 Hours	48 Hours	60 Hours	72 Hours
FLORA (Cont'd.)									
10/7	12Z	20.6	78.4	29	102	163	273	389	528
10/8	12Z	20.9	76.0	13	105	235	409	652	925
10/9	00Z	21.7	74.8	88	189	294	440	660	
	12Z	23.4	71.6	52	100	210	352		
10/10	00Z	25.7	68.4	125	225	316			
	12Z	27.8	64.6	228	360				
AVERAGE ERROR				62	141	201	294	440	485
GINNY									
10/21	12Z	34.2 N	74.4 W	31	154	374	555	709	887
10/22	12Z	32.5	75.1	68	140	278	435	532	604
10/23	00Z	29.9	76.1	81	179	226	209	236	206
	12Z	28.9	77.7	78	221	242	248	99	12
10/24	00Z	28.8	78.5	52	102	247	294	311	267
	12Z	29.5	79.4	43	134	192	258	277	311
10/25	00Z	30.1	79.6	32	87	81	85	109	138
	12Z	31.8	79.6	94	32	42	73	114	235
10/26	00Z	32.3	77.5	104	161	222			
	12Z	33.3	77.0	42	76	102	216	426	709

TABLE I
(Cont'd.)

INITIAL POSITION									
Date	Time	Latitude	Longitude	12 Hours	24 Hours	36 Hours	48 Hours	60 Hours	72 Hours
GINNY (Cont'd.)									
10/27	12Z	32.9	75.2	35	112	267	538		
10/28	00Z	32.8	73.5	89	280	463			
	12Z	33.9	72.4	66	245				
10/29	00Z	36.5	70.9	158					
AVERAGE ERROR				70	148	228	291	313	374
HELENA									
10/28	12Z	17.9 N	60.3 W	45	100				
AVERAGE ERROR FOR ALL FORECASTS				(43) 67	(42) 143	(37) 217	(29) 301	(23) 368	(19) 443

[1]Errors are in nautical miles. ( ) indicates number of forecasts averaged.

TABLE II

HURRICANE FORECASTS (LOWER CALIFORNIA) - 1963

INITIAL POSITION									
Date	Time	Latitude	Longitude	12 Hours	24 Hours	36 Hours	48 Hours	60 Hours	72 Hours
IRAH									
9/13	00Z	22.0 N	128.0 W	263	500	783			
LILIAN									
9/24	12Z	17.2 N	102.2 W	37	87	83	101	150	259
9/25	00Z	17.3	103.3	145	180				
9/27	00Z	20.5	108.0	30	62				
AVERAGE ERROR				71	110	83	101	150	259
AVERAGE ERROR FOR ALL FORECASTS				(4)119	(4)207	(2)433	(1)101	(1)150	(1)259

[1] Errors are in nautical miles. ( ) indicates number of forecasts averaged.

TABLE III

TYPHOON FORECASTS (WESTERN AND CENTRAL PACIFIC) - 1963

INITIAL POSITION									
Date	Time	Latitude	Longitude	12 Hours	24 Hours	36 Hours	48 Hours	60 Hours	72 Hours
OLIVE									
5/2	00Z	20.7 N	150.2 E	33	90	126	118	134	115
5/3	00Z	24.4	154.3	66	35	107			
	12Z	26.6	156.4	217	414	431	484	517	
5/4	00Z	26.6	159.8	95	183	172	231		
5/5	00Z	29.6	168.6	175	281	162			
5/6	00Z	33.2	173.7	149	318				
AVERAGE ERROR				123	220	200	278	326	115
POLLY									
6/3	00Z	23.4 N	133.3 E	84	162	237	325	472	621
6/4	00Z	27.7	136.0	110	248	241	353		
6/5	12Z	37.4	146.3	67					
AVERAGE ERROR				87	205	239	339	472	621

TABLE III
(Cont'd.)

INITIAL POSITION

Date	Time	Latitude	Longitude	12 Hours	24 Hours	36 Hours	48 Hours	60 Hours	72 Hours
ROSE									
6/10	00Z	20.6 N	122.7 E	73	137	249	304	356	356
	12Z	22.4	124.1	91	97	131	151	283	201
6/11	00Z	23.1	124.8	61	103	145	170	222	
	12Z	23.7	126.4	63	111	173	252		
AVERAGE ERROR				72	112	175	219	287	279
SHIRLEY									
6/17	00Z	20.6 N	127.5 E	25	84	204			
6/18	00Z	24.9	125.6	65	163	258	214	398	781
	12Z	27.2	124.9	69	91	134	353	634	
6/19	12Z	30.4	124.5	348	428	900			
6/20	00Z	36.0	128.5	186	431				
	12Z	40.6	134.4	410	1365				
AVERAGE ERROR				184	427	374	284	516	781

TABLE III
(Cont'd.)

INITIAL POSITION									
Date	Time	Latitude	Longitude	12 Hours	24 Hours	36 Hours	48 Hours	60 Hours	72 Hours
TRIX									
6/28	12Z	18.5 N	119.5 E	145	156	252			
6/29	00Z	19.3	118.4	51	141	178	232		
	12Z	20.2	117.7	85	168	255			
6/30	00Z	20.5	117.1	30	83				
	12Z	21.6	116.4	50					
AVERAGE ERROR				72	137	228	232		
WENDY									
7/12	12Z	15.7 N	139.6 E	61	113	120			
7/13	00Z	17.3	137.5	50	46	121	175	332	339
7/14	00Z	19.4	131.9	37	53	21	217	358	478
	12Z	20.9	129.1	32	78	266			
7/15	12Z	21.4	124.2	110	150	248	328		
7/16	12Z	25.0	120.7	46	43	186			
AVERAGE ERROR				56	81	160	240	345	409

TABLE III
(Cont'd.)

INITIAL POSITION

Date	Time	Latitude	Longitude	12 Hours	24 Hours	36 Hours	48 Hours	60 Hours	72 Hours
AGNES									
7/19	12Z	17.9 N	125.4 E	120	205	224	229	260	304
7/20	12Z	18.2	121.6	80	147	224	179		
7/21	00Z	19.2	118.6	61	149	153			
	12Z	20.2	115.5	62	114				
AVERAGE ERROR				81	154	200	204	260	304

TABLE III
(Cont'd.)

INITIAL POSITION

Date	Time	Latitude	Longitude	12 Hours	24 Hours	36 Hours	48 Hours	60 Hours	72 Hours
BESS									
8/4	00Z	19.4 N	137.2 E	30	59	170	310	428	575
	12Z	20.7	136.5						
8/5	00Z	21.0	136.5	141	239	284	322	324	375
8/7	12Z	27.8	133.0	87	231	292	421		
8/8	00Z	28.6	132.9	95	148	165	167	194	
	12Z	30.3	133.2	44	74	100	95		
8/9	00Z	32.1	132.4	19	77	204			
	12Z	33.5	131.2	42	131				
AVERAGE ERROR				65	137	203	263	315	475
CARMEN									
8/13	12Z	14.9 N	123.0 E	61	115	179	190	214	336
8/14	00Z	16.1	121.2	53	104	104	116	180	234
	12Z	17.2	118.8	102	189	133	235		
8/15	00Z	18.3	116.2	73	133	96	240		
8/16	00Z	18.7	110.8	149	250				
AVERAGE ERROR				88	158	128	195	197	285

TABLE III
(Cont'd.)

INITIAL POSITION									
Date	Time	Latitude	Longitude	12 Hours	24 Hours	36 Hours	48 Hours	60 Hours	72 Hours
DELLA									
8/26	12Z	29.2 N	131.3 E	29	104	152	167	169	155
8/27	00Z	30.6	132.4	36	27	49	146	240	356
	12Z	31.5	132.9	50	131	248	330	424	388
8/28	00Z	32.8	134.7	33	129	97	330	328	128
	12Z	33.9	137.3	85	156	267	283		
8/29	00Z	35.1	141.2	78	250	199	243		
	12Z	36.2	145.1	14	73				
AVERAGE ERROR				46	124	169	250	290	257
ELAINE									
8/26	12Z	28.7 N	153.6 E	42	100	145	481	534	397
8/27	00Z	31.3	154.4	26	36	346	436	409	436
	12Z	33.4	157.1	56	253	259	222	274	
8/28	00Z	34.9	160.3	288	346	219	143		
	12Z	39.9	168.0	362	472				
AVERAGE ERROR				155	241	242	321	406	417

TABLE III
(Cont'd.)

INITIAL POSITION

Date	Time	Latitude	Longitude	12 Hours	24 Hours	36 Hours	48 Hours	60 Hours	72 Hours
FAYE									
9/3	12Z	17.5 N	128.9 E	19	33	46	59	46	41
9/4	00Z	18.9	126.7	31	85	123	194	274	364
	12Z	19.9	123.8	30	84	140	231		
9/5	00Z	19.9	121.0	30	128	122			
	12Z	20.3	118.1	110	152	211			
9/6	00Z	20.4	116.8	18	67				
	12Z	20.3	114.2	16	115	182			
AVERAGE ERROR				36	95	137	161	160	203
GLORIA									
9/7	00Z	18.1 N	136.2 E	17	41	38	144	246	354
	12Z	19.4	134.1	75	61	56	78	167	236
9/8	00Z	19.7	131.6	36	78	78	240	346	358
	12Z	20.8	129.8	25	66	153	239	274	302
9/9	12Z	22.3	126.5	77	196	259	320		
9/10	12Z	23.9	124.6	57	26	77	170	248	426
9/11	00Z	25.1	122.3	82	175	257			
	12Z	25.3	121.3	111	161				
AVERAGE ERROR				60	101	131	199	256	335

TABLE III
(Cont'd.)

INITIAL POSITION

Date	Time	Latitude	Longitude	12 Hours	24 Hours	36 Hours	48 Hours	60 Hours	72 Hours
JUDY									
9/30	12Z	16.3 N	148.3 E	66	179	299	374	423	514
10/1	00Z	18.3	146.8	85	183	292	451	680	935
10/2	00Z	23.0	143.3	69	232	430	627	883	
10/3	12Z	28.8	143.5	97	238	306	393		
10/4	00Z	31.3	145.2	83	95	137			
	12Z	33.8	147.8	143	324				
AVERAGE ERROR				91	209	293	461	662	725
KIT									
10/7	12Z	20.2 N	136.1 E	130	185	166	139	264	414
10/9	00Z	20.9	132.2	8	63	198	311	660	954
	12Z	21.7	131.2	101	261	467	806	1076	
10/10	00Z	23.8	132.2	19	53	278	455		
	12Z	25.9	133.9	48	251	429			
10/11	00Z	27.8	136.5	212	384				
	12Z	31.6	143.2	187					
AVERAGE ERROR				101	200	308	428	667	684

TABLE III
(Cont'd.)

INITIAL POSITION

Date	Time	Latitude	Longitude	12 Hours	24 Hours	36 Hours	48 Hours	60 Hours	72 Hours
LOLA									
10/15	00Z	18.2 N	143.0 E	34	37	112	142	168	212
	12Z	18.8	141.2	76	62	169	316	477	630
10/17	12Z	21.1	135.9	56	156	184	278	435	
10/18	12Z	24.2	137.1	92	185	125			
10/19	00Z	26.7	138.3	86	56				
AVERAGE ERROR				69	99	148	245	360	421
MAMIE									
10/16	00Z	21.2 N	154.4 E	61	39	45	38	74	202
10/17	12Z	27.4	149.7	263	326	380			
10/18	00Z	30.4	150.7	97	207				
AVERAGE ERROR				140	191	213	38	74	202
ORA									
10/27	00Z	23.2 N	153.5E	129	192	107	298	414	648
10/28	00Z	24.8	148.9	151	376	474	582		
	12Z	26.1	150.0	152	207	310			

TABLE III
(Cont'd.)

INITIAL POSITION

Date	Time	Latitude	Longitude	12 Hours	24 Hours	36 Hours	48 Hours	60 Hours	72 Hours
ORA (Cont'd.)									
10/29	00Z	29.1	152.2	33	117				
	12Z	31.9	152.8	154					
AVERAGE ERROR				124	223	297	440	414	648
SUSAN									
12/25	12Z	15.3 N	142.4 E	46	113	264	316	430	558
12/26	00Z	16.0	140.0	29	163	254	399		
12/27	00Z	18.3	139.2	52	109	340	607		
	12Z	20.0	140.3	43	240	426			
12/28	00Z	22.3	144.5	119	302				
AVERAGE ERROR				58	185	321	441	430	558
AVERAGE ERROR FOR ALL FORECASTS				(104) 87	(100) 170	(83) 212	(62) 281	(42) 364	(34) 404

[1] Errors are in nautical miles. ( ) indicates number of forecasts averaged.

TABLE IV

HURRICANE (ATLANTIC AND GULF OF MEXICO AREAS) FORECASTS

1956 thru 1963

YEAR	12 HOURS	24 HOURS	36 HOURS	48 HOURS	72 HOURS
1956	---------	(15) 107	(1) 100	(10) 229	(4) 300
1957	(9) 51	(10) 79	(7) 146	(6) 241	(3) 510
1958	(59) 102	(48) 194	(50) 294	(44) 357	(32) 595
1959	(40) 68	(38) 129	(36) 191	(29) 257	(19) 361
1960	(19) 70	(19) 142	(19) 242	(13) 318	(5) 450
1961	(88) 74	(84) 148	(74) 228	(34) 317	(22) 530
1962	(32) 77	(29) 146	(24) 232	(19) 308	(11) 450
1963	(43) 67	(42) 143	(37) 217	(29) 301	(19) 443

[1] Errors are in nautical miles by forecast periods. ( ) indicates number of forecasts averaged.

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