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Beach Changes at Atlantic City, New Jersey (1962-73)

by

Dennis P. McCann

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Beach Erosion Program	Shoreline changes									
Beach nourishment	Shore structures									
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)										
<p>Repetitive surveys of the above MSL beach were made along seven profile lines at Atlantic City, on the northeast end of Absecon Island, New Jersey, from 1962 to 1973. Major beach-fill projects were accomplished in 1963 and 1970 which introduced approximately 428,000 and 635,000 cubic meters of fill material, respectively, to the northernmost half of the study area; movements of this material are discussed. Seventeen storms were reasonably well</p>										
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documented during the study and their effects are reported. Measured storm changes were highly variable. For a given storm, adjacent profiles often indicated opposite changes, with one accreting and one eroding. This is attributed to structural effects, as well as wave refraction effects near Absecon Inlet. Storm changes of the MSL shoreline position were often opposite in sign from beach volume changes. Frequently, the shoreline change indicated accretion, while the beach volume actually suffered a net loss. The largest beach changes measured resulted from the storm of 23 September 1964, which eroded an average of about 23 cubic meters per meter of beach face above MSL, and the storms of 16 September 1967 and 25 February 1968, which caused an average shoreline recession of 5.9 meters. Beach changes were found to be seasonal, with the greatest volume of sand above MSL from May to October. The data collected provide no information on the profile changes occurring below MSL.

PREFACE

This report is published to provide coastal engineers with a description of beach changes at Atlantic City, New Jersey. The 11-year study was designed to measure beach responses to storm events as well as seasonal variations, and was begun shortly after, and as a consequence of the devastating storm of 5 to 9 March 1962. The work was carried out under the coastal processes program of the U.S. Army Coastal Engineering Research Center (CERC).

The report was prepared by Dennis P. McCann with the assistance of A.E. DeWall, under the general supervision of C. Mason, former Chief of the Coastal Processes Branch, Research Division.

The U.S. Army Engineer District, Philadelphia, performed all survey work except for a period in 1963-64 when data collection was contracted to Mauzy, Morrow & Associates of Lakewood, New Jersey. All data analyses and interpretations were made at CERC with assistance by M. Fleming, T. Lawler, D. French, A.E. DeWall, and W.A. Birkemeier.

Special thanks are extended to the visual observers from the City Engineer's Office of Atlantic City: J. Dolan, R. Badger, C. Turner, and C. McDonnell. Thanks are also extended to C.H. Everts, C. Galvin, K. Jacobs, M.T. Czerniak, and A.E. DeWall for their substantial contributions to this report from previous work on this subject. The author acknowledges the helpful review comments from A.E. DeWall, W.A. Birkemeier, C. Galvin, R.M. Sorensen, and R.J. Hallermeier.

Comments on this publication are invited.

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TED E. BISHOP
Colonel, Corps of Engineers
Commander and Director

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U.S. customary units of measurement used in this report can be converted to metric (SI) units as follows:

Multiply	by	To obtain
inches	25.4	millimeters
	2.54	centimeters
square inches	6.452	square centimeters
cubic inches	16.39	cubic centimeters
feet	30.48	centimeters
	0.3048	meters
square feet	0.0929	square meters
cubic feet	0.0283	cubic meters
yards	0.9144	meters
square yards	0.836	square meters
cubic yards	0.7646	cubic meters
miles	1.6093	kilometers
square miles	259.0	hectares
knots	1.852	kilometers per hour
acres	0.4047	hectares
foot-pounds	1.3558	newton meters
millibars	1.0197×10^{-3}	kilograms per square centimeter
ounces	28.35	grams
pounds	453.6	grams
	0.4536	kilograms
ton, long	1.0160	metric tons
ton, short	0.9072	metric tons
degrees (angel)	0.01745	radians
Fahrenheit degrees	5/9	Celsius degrees or Kelvins

To obtain Celsius (C) temperature readings from Fahrenheit (F) readings, use formula: $C = (5/9)(F - 32)$.

To obtain Kelvin (K) readings, use formula: $K = (5/9)(F - 32) + 273.15$.

BEACH CHANGES AT ATLANTIC CITY, NEW JERSEY (1962-73)

by
Dennis P. McCann

I. INTRODUCTION

Beach changes observed during repetitive surveys at Atlantic City, New Jersey, conducted by or for the Corps of Engineers in a 11-year study of seven profile lines from October 1962 to May 1973, are analyzed as part of the U.S. Army Coastal Engineering Research Center (CERC) Beach Evaluation Program (BEP) (formerly known as the Pilot Program for Improving Coastal Storm Warnings or Storm Warning Program). The BEP's objective is to measure beach and dune changes due to erosion and accretion at selected localities and relate these changes to the coastal processes producing them. The BEP was a direct outcome of investigations into the effects of the Great East Coast Storm of 1962 (see U.S. Congress, 1962).

Although this report meets the objective of the BEP, the program encountered many difficulties, including relatively few documented storms in the study area from 1962 to 1973 (the duration of the study), the difficulty in obtaining surveys immediately before and after the storms which did occur, and the difficulty and expense of obtaining continuous wave data. However, numerous data were collected of related wave, tide, and beach conditions, thus providing a substantial base for a long-term study of beach response having useful engineering applications.

This report presents both quantitative and qualitative analyses of beach profile changes and supporting data obtained at Atlantic City, and describes the survey procedures used and accuracy obtained. The three categories of beach profile changes analyzed are: (a) short-term changes, including storm-induced changes and other changes between surveys; (b) long-term changes, including seasonal and yearly changes; and (c) artificial effects, which include the effects of manmade structures such as groins and jetties as well as beach fill placed during the study period. The mean sea level (MSL) shoreline position and the volumes of sand stored on the beach above the MSL datum are the two principal variables analyzed. Observed wave conditions and climatic conditions are used to explain apparent trends in beach changes.

II. STUDY AREA

1. Location.

Atlantic City is located on Absecon Island, a barrier island off the Atlantic coast of southern New Jersey, 161 kilometers south of New York City (Fig. 1). The island is bounded on the south by Great Egg Harbor Inlet, and on the north by Absecon Inlet, and has a straight coastline oriented 64° east of north. Lakes Bay is the main body of water separating the island from the mainland.

Absecon Island is situated in an open section of coastline, partially sheltered by Long Island and Cape Cod from waves out of the north and north-east and by the Outer Banks of North Carolina from waves out of the south-southeast (Fig. 1). Bathymetry off the coast of Absecon Island is shown in

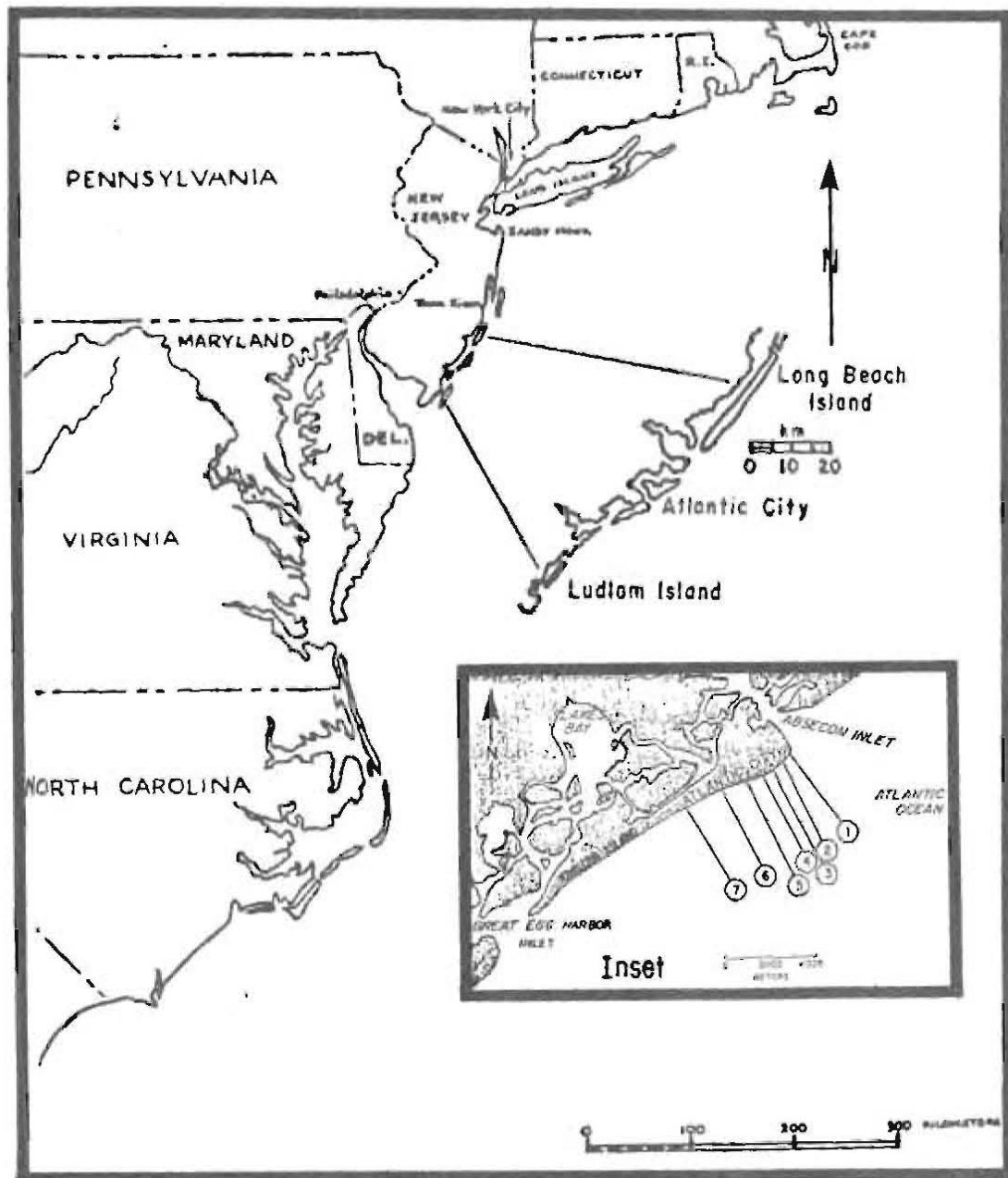


Figure 1. Study area showing profile line locations.

Figure 2. Most of the depth contours tend to be roughly shore-parallel, with linear shoals that trend toward the east off the central part of the island. The distance from the edge of the Continental Shelf, located at a depth of about 128 meters (420 feet), to the center of the island is approximately 125 kilometers.

2. Civil Works History.

Absecon Inlet is of great economic importance to Atlantic City as a result of its extensive use by recreational and commercial fishing fleets. During the early 1960's the inlet handled approximately 91,000 metric tons of water-borne commerce annually; however, this has recently tapered off to average

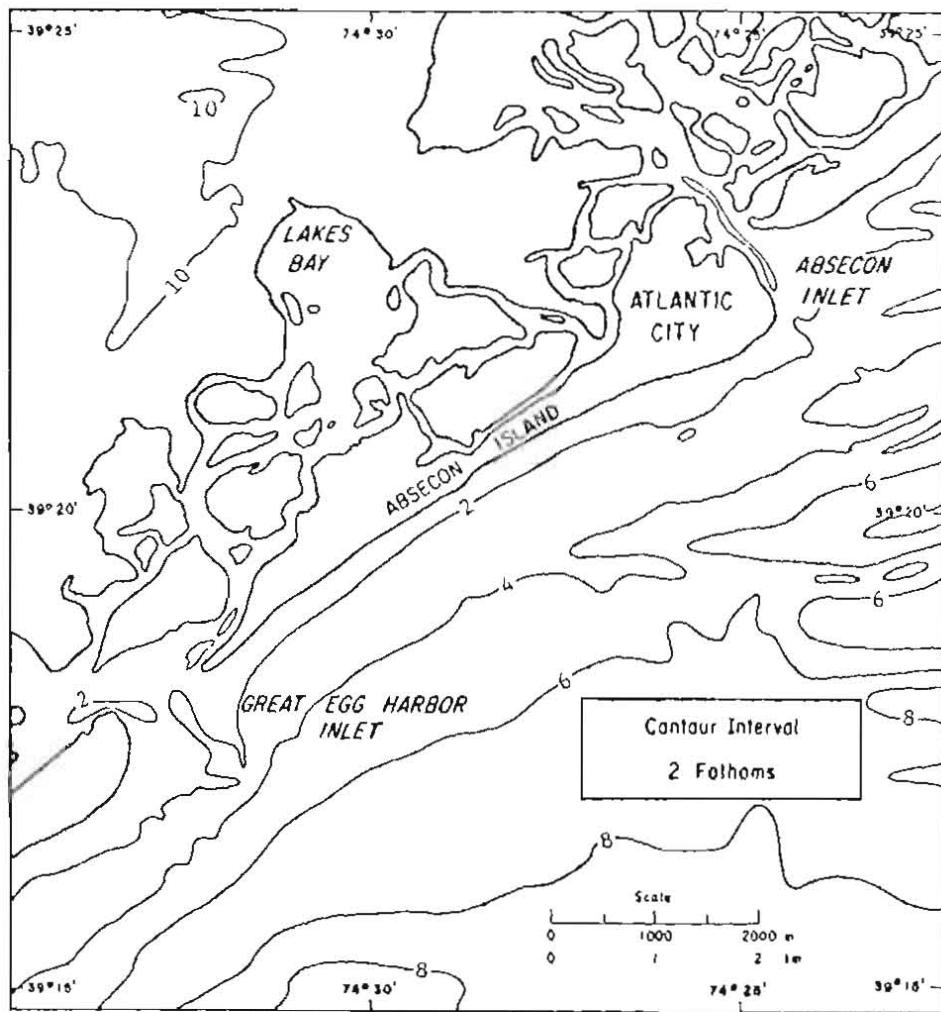


Figure 2. Bathymetry off Absecon Island.

less than 46,000 metric tons. Absecon Inlet has been maintained by the Federal Government since 1910.

Croin construction along the ocean frontage of Atlantic City, funded jointly by the City and State, began in 1928; 12 groins and 1 jetty were built between Absecon Inlet and Illinois Avenue. Eight of these groins and the jetty are still in existence, as shown in Figure 3 and in Table 1 which lists the coastal structures at Atlantic City. Other major structures (see Table 1 and Fig. 3) include the Boardwalk, which extends along the entire length of the ocean and inlet frontage, and five piers. Some of these structures are shown in Figure 4.

The only beach-fill project before 1962 consisted of about 816,000 cubic meters of material placed along the ocean frontage in 1948. However, an offshore sand-dumping test was conducted from 1935 to 1943 in which 2.7 million cubic meters was dumped into 5 to 6 meters of water southwest of Steel Pier which resulted in no measurable benefit to the shoreline (Yasso and Hartman, 1975). Approximately 428,000 cubic meters of sand was placed between Oriental and Virginia Avenues between February and May 1963. During the summer of 1970, approximately 635,000 cubic meters of fill was dumped along the beaches

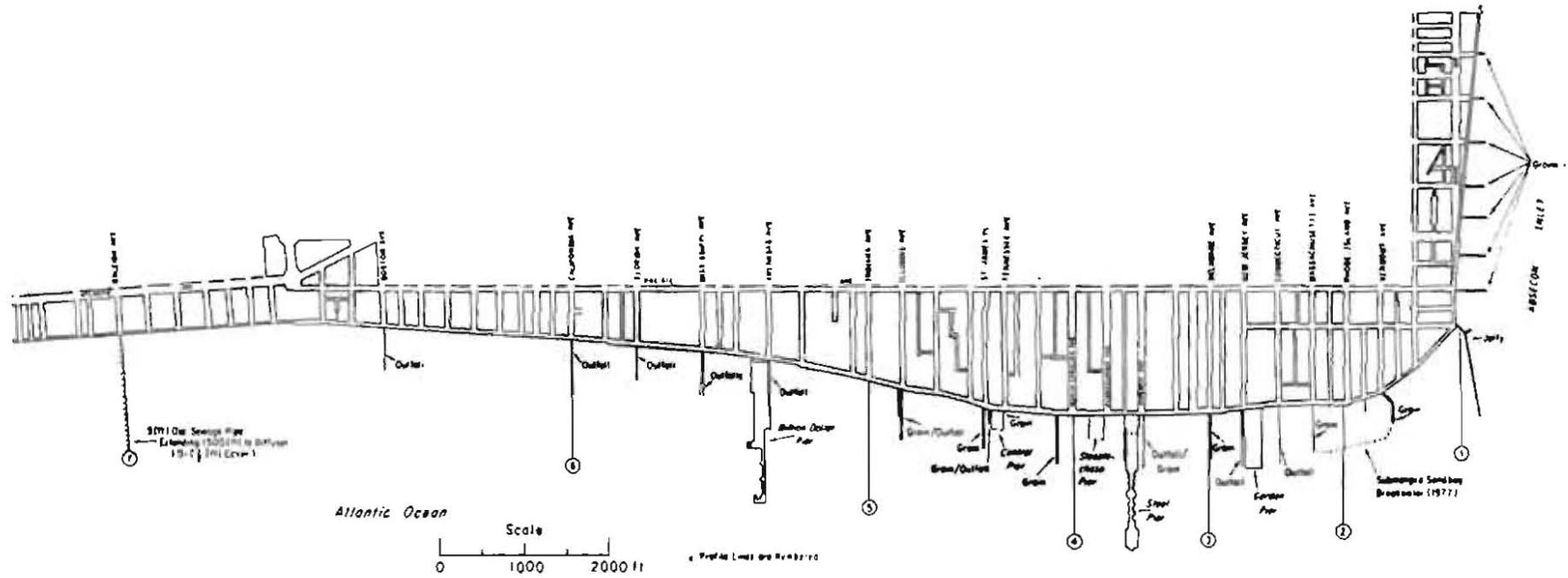


Figure 3. Structures along Absecon Inlet and Atlantic City ocean front.

Table 1. Structures along Absecon Inlet and the coast off Atlantic City¹.

Location	Construction type	Top elevation (MLW)		Top width (m)	Length (m)	Year built	Condition 1972
		inner (m)	outer (m)				
N. side of Absecon Inlet	Stone jetty	2.44	2.44	4.57	1,137.00	1952-66	Good
Between Caspian and Melrose Aves.	Timber bulkhead	----	----	0.76	588.00	1935	Good
Adriatic Ave.	Timber and stone groin	2.44	2.13	4.27	86.56	1932-58	Good
Drexel Ave.	Timber and stone groin	2.44	2.13	4.27	50.29	1930-46	Fair
Melrose Ave.	Timber and stone groin	2.44	2.13	4.27	81.08	1954	Good
Melrose Ave., to 91 m south	Stone revetment	----	----	----	----	----	----
Madison Ave.	Timber and stone groin	2.74	2.13	4.27	68.58	1954	Good
Between Madison and Euclid Aves.	Timber bulkhead groin	----	----	0.61	457.20	1935-61	Good
Gramercy Ave.	Timber and stone groin	2.74	2.13	4.27	79.25	1954	Good
Between Gramercy and Atlantic Aves.	Stone groin	3.05	2.13	4.27	102.41	1946-56	Good
Between Atlantic and Euclid Aves.	Stone groin	2.74	2.13	4.27	94.49	1946-58	Good
Pacific Ave.	Stone groin	2.44	2.13	4.27	102.41	1946-58	Good
Oriental Ave. (36.6 m N. of profile 1)	Stone jetty	3.35	2.13	4.27	358.75	1946-61	Good
Vermont Ave.	Stone groin	3.05	0.30	4.27	121.92	1930-61	Good
Musachusetts Ave.	Stone groin	3.05	2.13	4.57	167.64	1948	Good
Between Vermont and Massachusetts Aves.	Sandbag breakwater	Top is approx.		1.2 m below MLW			
Between Connecticut and Massachusetts Aves.	Timber bulkhead	----	----	----	----	1932	Poor
Connecticut Ave.	0.5-m outfall	----	----	----	----	----	----
Under N. edge of Garden Pier	Timber and stone groin	----	----	----	----	----	Poor
New Jersey Ave.	Garden Pier (0.76-m outfall)	----	----	----	----	----	----
Delaware Ave. (4.6 m N. of profile 3)	Timber groin	2.44	2.13	1.22	182.88	1950	Fair
Virginia Ave.	Timber and stone groin (0.76-m outfall)	2.44	2.13	1.22	167.64	1950	Good
Between Presbyterian and Virginia Aves.	Steel Pier (old timber groin beneath)	----	----	----	----	----	----
Between North Carolina and Pennsylvania Aves.	Sleepchase Pier (0.91-m outfall to S.)	----	----	----	----	----	----
Between North and South Carolina Aves.	Timber groin (60 m S. of profile 4)	2.44	2.13	1.22	182.88	1950	Good
Tennessee Ave. (N. of Central Pier)	Stone groin	2.44	2.13	4.27	43.59	1928	Poor
Between Tennessee Ave. and St. James Place	Central Pier-Timber groin (0.76-m outfall)	----	----	----	----	----	----
St. James Place	Timber groin	2.44	0.61	1.22	147.83	1950	Fair
Illinois Ave.	Timber and stone groin (0.91-m outfall)	2.44	0.61	1.22	182.88	1950	Poor
Arkansas Ave.	0.91-m outfall at N. edge of Million Dollar Pier	----	----	----	----	----	----
Mississippi Ave.	0.61-m double outfall	----	----	----	----	----	----
Florida Ave.	0.61-m outfall	----	----	----	----	----	----
California Ave.	0.91-m outfall	----	----	----	----	----	----
Boston Ave.	0.91-m outfall	----	----	----	----	----	----
Raleigh Ave.	1.5-m sewage pipe extending 57 m to diffuser	----	----	----	----	----	----

¹Updated from U.S. Army Engineer District, Philadelphia (1974).

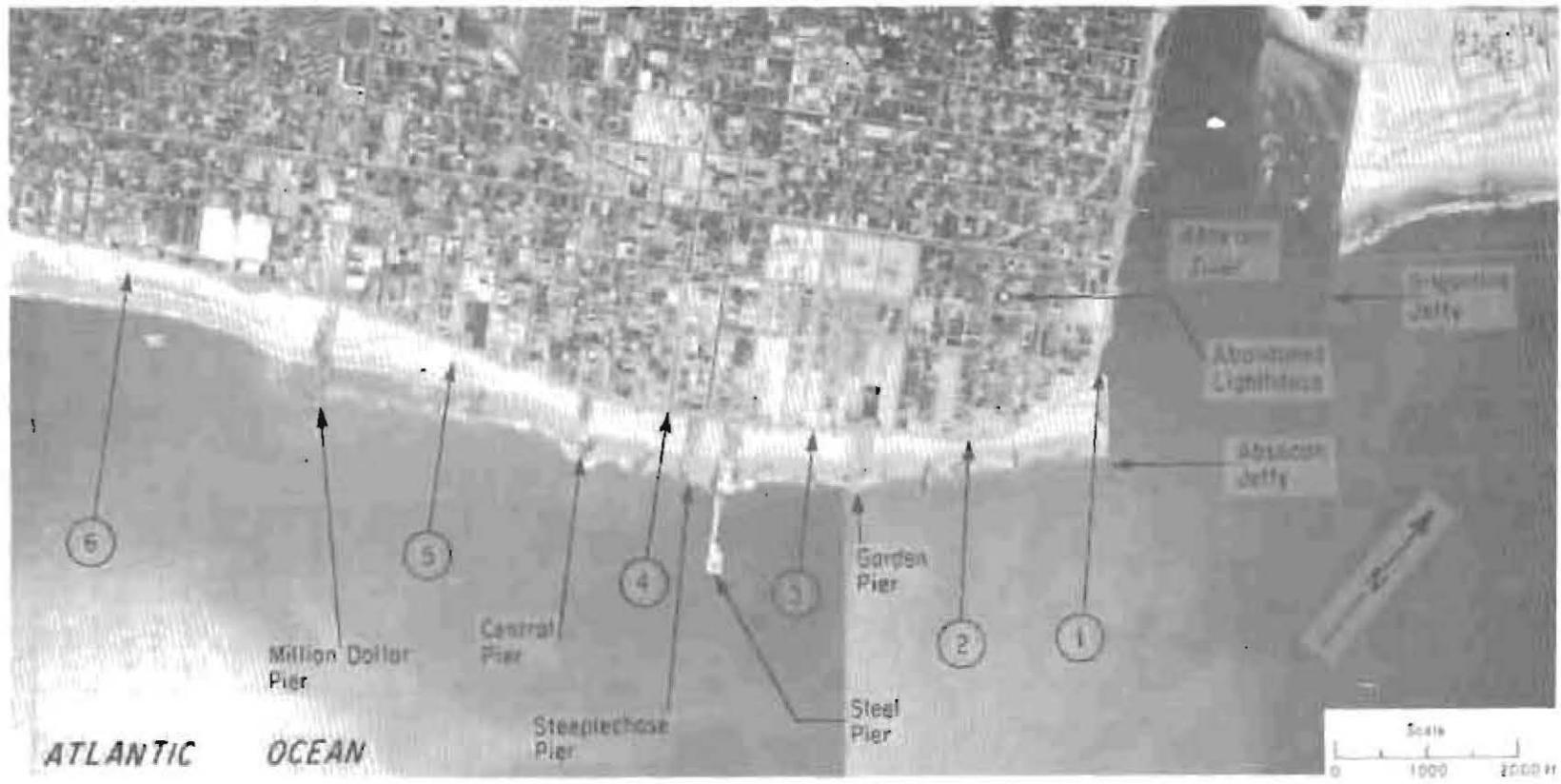


Figure 4. Aerial view of Absecon Inlet and Atlantic City (30 April 1973).

between Oriental and Illinois Avenues (Fig. 3). The source of this dredged material has been Absecon Inlet, just inside the Brigantine jetty (Fig. 4) (Everts, DeWall, and Czerniak, 1974).

A detailed discussion of civil works affecting the beaches on Absecon Island is presented by U.S. Army Engineer District, Philadelphia (1974).

3. Beach Material.

New Jersey beaches consist mainly of medium- to fine-grained sand, composed mostly of quartz. The Piedmont and Highlands of the Appalachian Province provide the ultimate source of the beach sands. Presently, due to the low terrain and gentle slopes of the Coastal Plain, the rivers draining the higher areas become sluggish and deposit much of their sediment load along the way before reaching the coast. What little sediment does reach the coast becomes trapped in the lagoons behind the barrier islands, and never reaches the beaches. The only natural sources of beach material now appear to be the ocean floor and the beaches themselves.

Ramsey and Calvin (1977) found the median grain size at Atlantic City to be 0.27 millimeter (1.9 phi), with a sample range of 0.22 to 0.33 millimeter, which agrees with the values obtained from surveys taken in 1936 and 1947 (Beach Erosion Board, 1950). They also determined that the grain size decreased from the north to the south, the direction of net littoral transport. This trend of decreasing grain size from north to south is shown in Figure 5 which indicates the southward decrease in grain size across three profiles at Atlantic City. A spatial trend in grain-size variation from the berm to mean low water (MLW) is also indicated in Figure 6 for the sample averages and in Figure 7 for the profile averages. These plots show an increase in grain size from the berm to MSL, and then a slight decrease from MSL to MLW. A seasonal grain-size variation shown in Figure 8 indicates that the grain size increases from about 0.25 millimeter in October to 0.30 millimeter in December while decreasing from about 0.30 millimeter in December to 0.26 millimeter in March. This trend suggests an increase in the slope of a stable foreshore from October to December when the sizes are increasing and a decrease in foreshore slope when the grain sizes are decreasing from December to March.

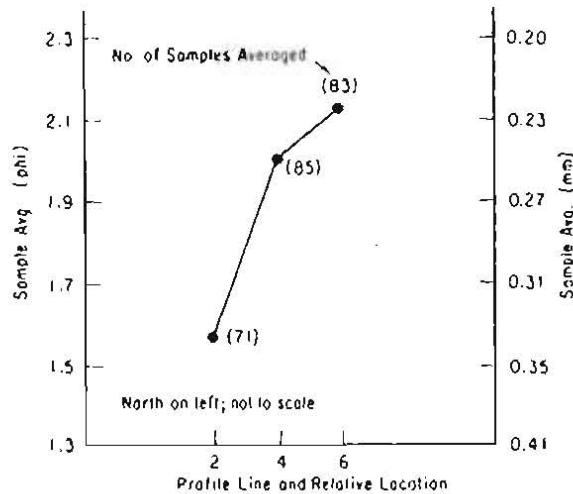


Figure 5. Southward decrease in median grain size at Atlantic City; sample averages are by profile line (from Ramsey and Calvin, 1977).

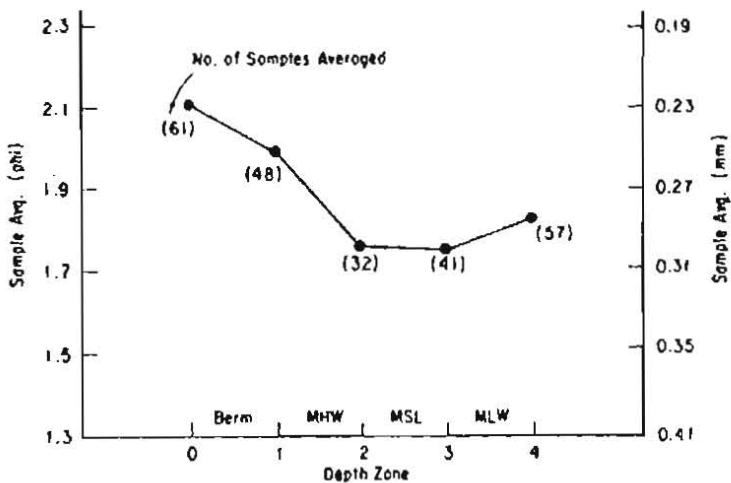


Figure 6. Median grain-size variation across profile at Atlantic City; data consisted of 238 samples collected between January 1968 and March 1969 (from Ramsey and Galvin, 1977).

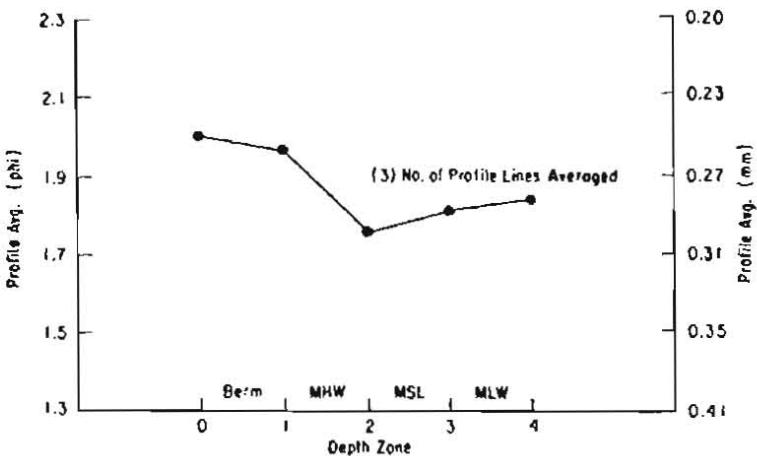


Figure 7. Median grain-size variation across profile at Atlantic City (from Ramsey and Galvin, 1977).

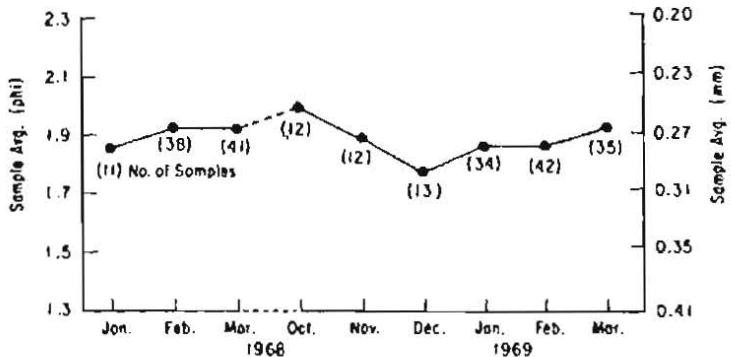


Figure 8. Monthly median grain-size variation at Atlantic City; samples were taken from the berm to below MSL (from Ramsey and Galvin, 1977).

The net littoral transport rate along Absecon Island is estimated to be 115,000 cubic meters annually in a southwesterly direction as determined from estimated gross northerly and southerly annual rates of 191,000 and 306,000 cubic meters, respectively (U.S. Army Engineer District, Philadelphia, 1974). Further evidence for southwest littoral transport is shown by Everts (1975) in the pattern of deposition that decreased the width of Great Egg Harbor Inlet (Fig. 1) 30 percent from 1949 to 1974. Everts also concludes that possibly 25 percent of the longshore transport could be accounted for by sand movement on bars.

Taking into consideration the previously mentioned lack of supply of beach material from natural sources along with the net littoral transport to the southwest, it is obvious that this imbalance of material leaving and entering the area results in erosion of the beaches. These circumstances, in turn, would require occasional beach nourishment to sustain the beach. Two such beach-fill projects were accomplished during the study period, as previously mentioned, with the fill material having a mean grain size of 0.3 millimeter (Everts, DeWall, and Czerniak, 1974). A buildup of sand occurred from 1877 to 1939 on the northern end of Absecon Island, which resulted in the Absecon Lighthouse being so far inland today.

4. Wind, Wave, and Tide Data.

Wind data shown in Figure 9 consist of hourly records obtained before the profile study period by the National Weather Service (NWS) from an anemometer atop the now abandoned Absecon Lighthouse (Fig. 4). Analysis of these data indicates that the predominant wind directions are from the south and west. The corresponding wind velocity from these directions is generally in the 22.5- to 45-kilometer-per-hour range (Fig. 9,b). This agrees with the resultant wind direction determined from data taken 16 kilometers inland at the Aviation Facilities Experimental Station from 1968-72 (Fig. 10). Figure 9,b also shows that most of the high-velocity winds (46.7+ kilometers per hour) were from the northeast. The resultant wind direction, as shown in Figure 10, is the magnitude of the vector sum of wind directions, and the average wind-speed indicated is the sum of the recorded windspeeds divided by the number of observations.

Winds are from the west-northwest during the winter months of November to March. From March to July the winds shift to the south with a shift back to the west from July to September. After an abrupt shift back to due south in October, the winds return to the west-northwest direction of the winter (Fig. 10).

Data from the Summary of Synoptic and Meteorological Observations (SSMO) (U.S. Naval Weather Service Command, 1970) show the predominant wind directions offshore of Atlantic City throughout the year (Fig. 11). Monthly data indicate that the winter winds of November to March are from the west and northwest, whereas the spring and summer winds of April to August are from the south and southwest. These trends are in general agreement with those indicated above for winds measured inland, except that neither September nor October show directions nearly as predominant as the other months.

The bearing of a line normal to the Atlantic City beach at Steel Pier is approximately 26° east of south. Waves impinging from east of the normal

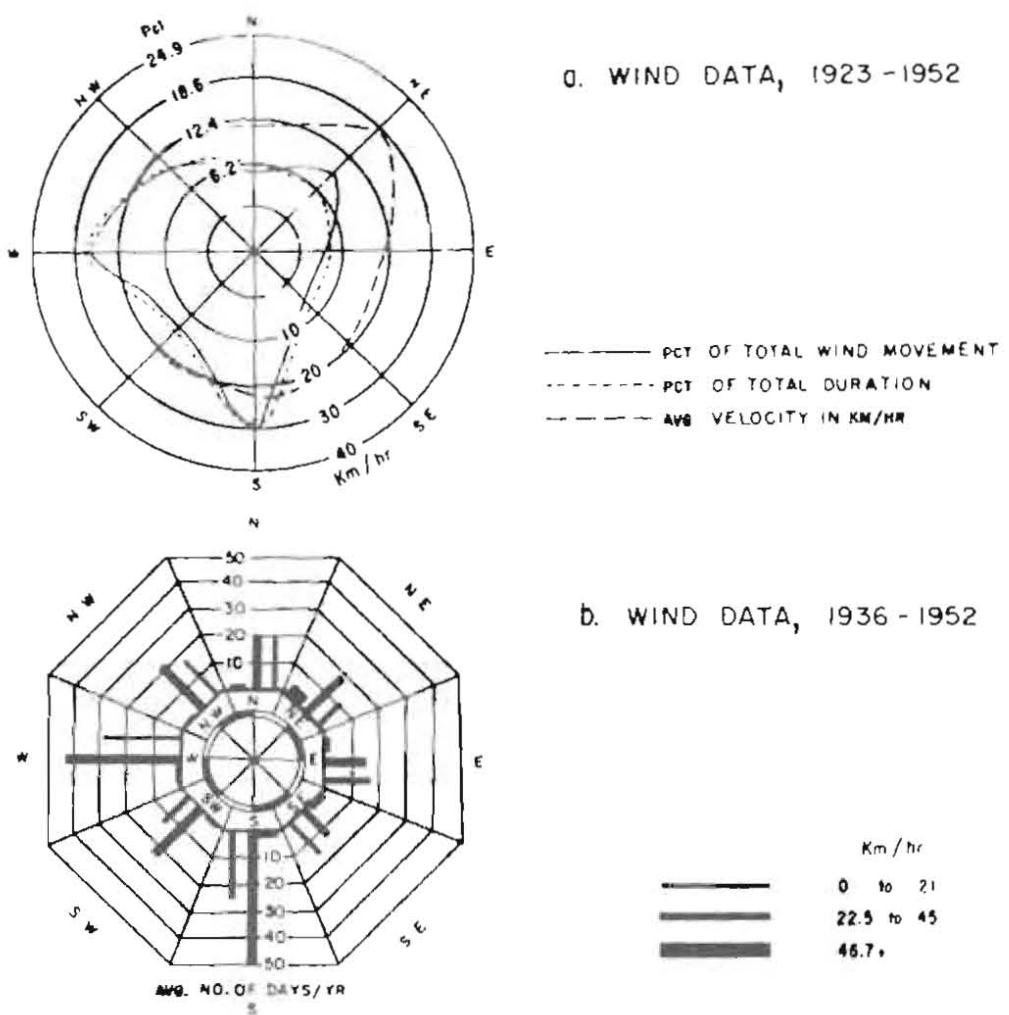


Figure 9. Wind data (yearly averages) for Atlantic City (from U.S. Army Engineer District, Philadelphia, 1974).

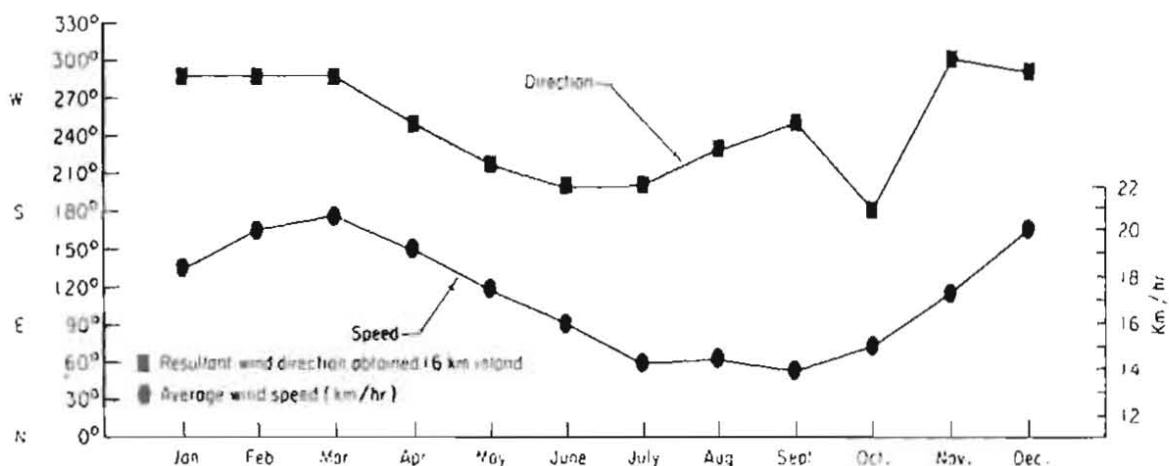


Figure 10. Mean monthly wind speed and direction at Atlantic City (1968-72).

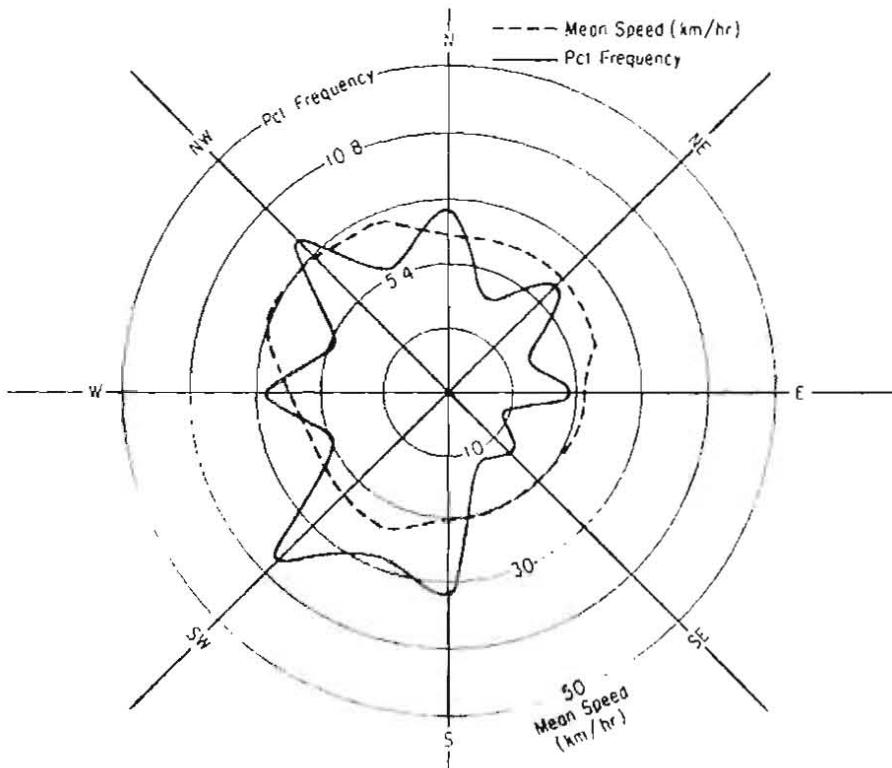


Figure 11. Annual wind distribution by percent frequency and mean speed for Atlantic City. Data obtained from SSMO (U.S. Naval Weather Service Command, 1970) collected during 1949-68 and covering the area from 38° to 40° N. latitude and 72° W. longitude to the coast.

result in a southwest, or "down-beach drift"; waves from west of the normal produce a northeast, or "up-beach drift." Results from visual wave observations obtained at different times at Atlantic City indicate that waves east of the normal occur greater than 50 percent of the time (Figs. 12 and 13). An earlier report by the U.S. Army Engineer District, Philadelphia (1938), also indicated a predominant down-beach drift occurring about 48 percent of the time compared to about 24 percent up-beach drift and 28 percent onshore-offshore drift.

CERC maintained a relay-type wave gage on the end of Steel Pier (5.2 meters mean water depth) from 1962 to 1969, which measured water surface elevations in 6-centimeter increments. These data, analyzed by Thompson (1977), indicate that during 1964 to 1967 the average significant wave height and average wave period increased substantially in September (Fig. 14). This is also in general agreement with Figure 4-10 in the Shore Protection Manual (SPM) (U.S. Army, Corps of Engineers, Coastal Engineering Research Center, 1977). The explanation for this behavior during this particular period is shown in Figures 15 and 16 which give the values by month for each of the years considered. The peak in values of period and height during September 1964 can be attributed to Hurricanes Dora, Ethel, and Gladys offshore along the Atlantic coast. Although none of these hurricanes directly hit New Jersey, they generated large waves which reached the shore. Historically, there is a substantial increase in tropical cyclones and hurricanes in the North Atlantic Ocean during September (Fig. 17); however, only a few

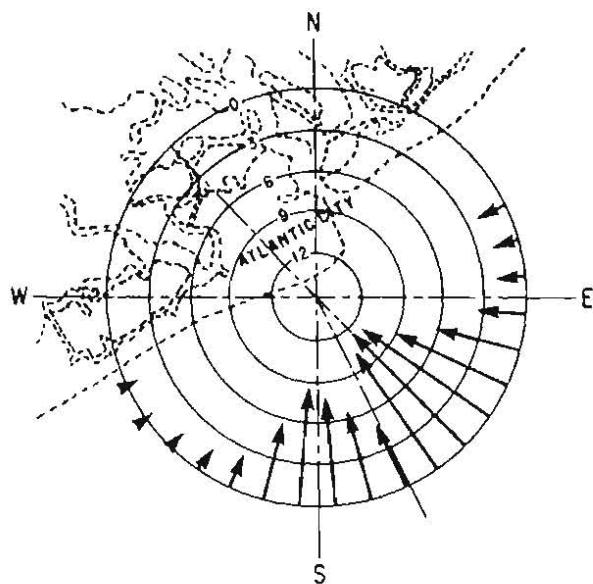


Figure 12. Wave approach at Steel Pier. Length of arrows indicates the percentage of wave approach from the various directions as determined by periodic observations at the end of Steel Pier during November 1935 to May 1937, and July 1947 to March 1948 (from Beach Erosion Board, 1950).

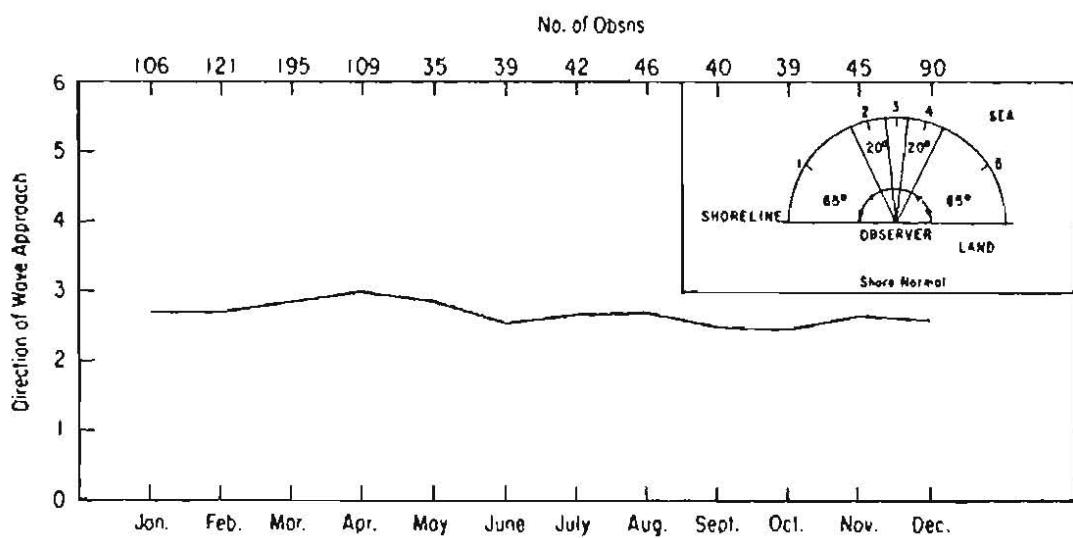


Figure 13. Mean wave direction by month for visual observations obtained from January 1968 to October 1974.

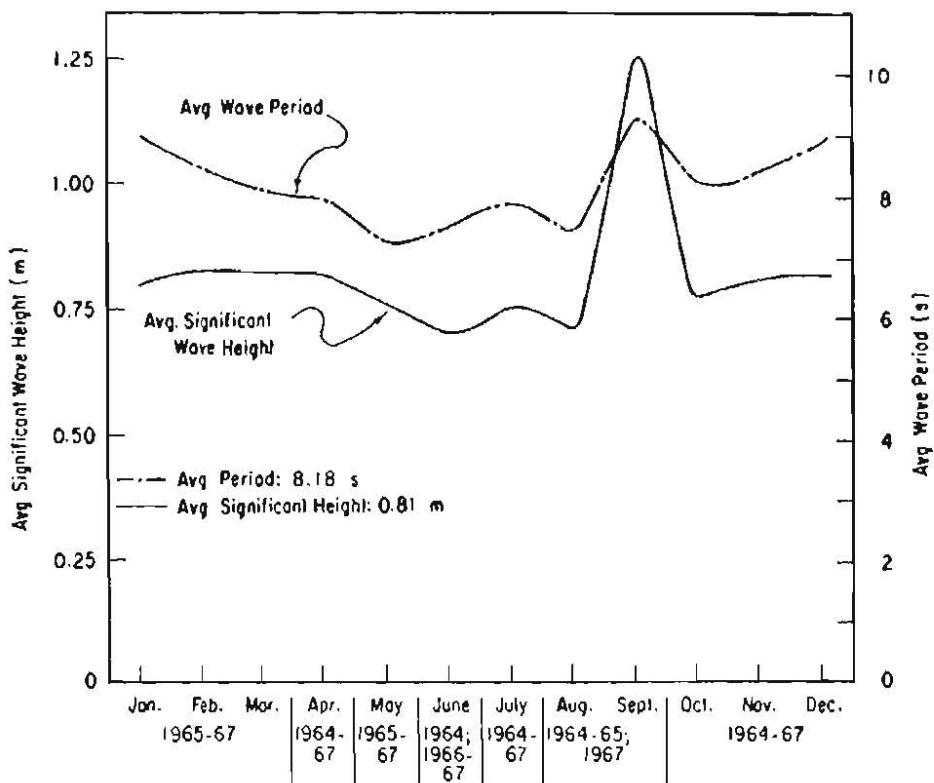


Figure 14. Average significant wave height and average wave period by month from April 1964 to December 1967.

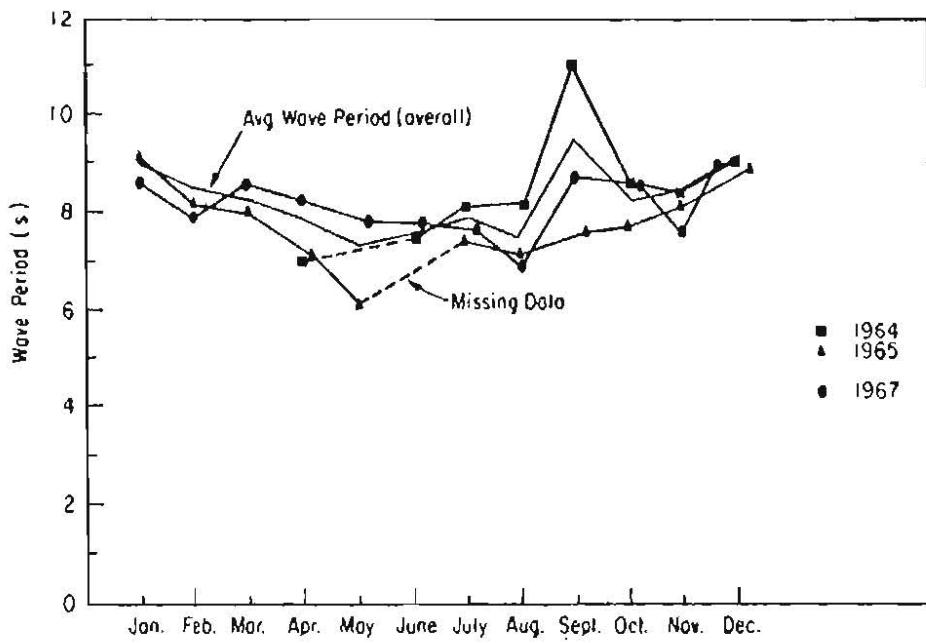


Figure 15. Means of wave periods for Atlantic City; determined from 7-minute pen-and-ink records taken six times daily during 1964, 1965, and 1967 (from Thompson, 1977).

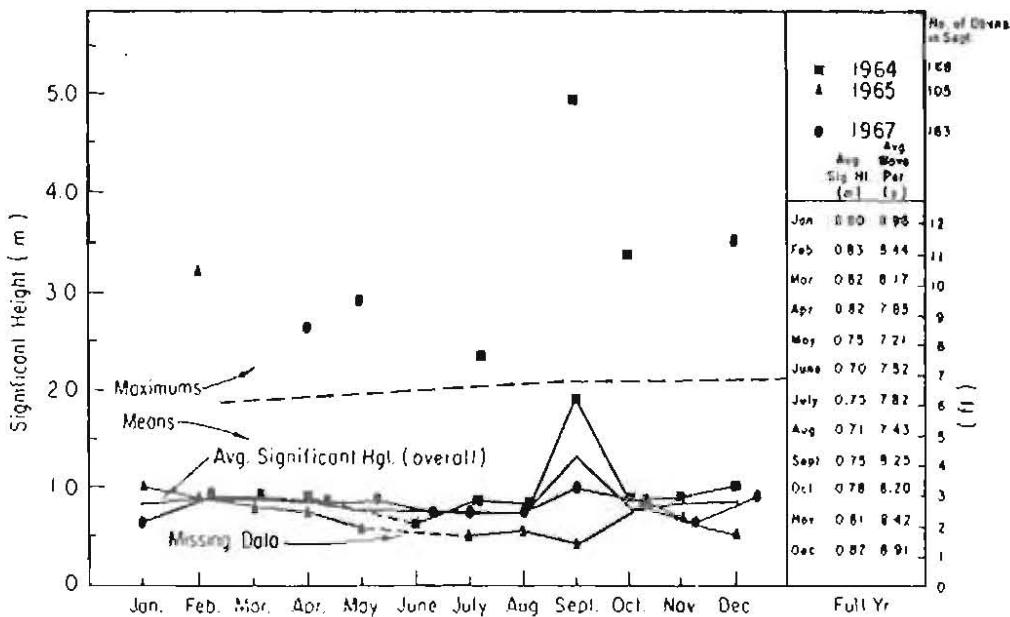


Figure 16. Maximums and means of significant wave height for Atlantic City; determined from 7-minute pen-and-ink records taken six times daily during 1964-65 and 1967. Values for September were obtained by determining the mean from the respective plot for height and period for 1965 and 1967, then weighted by the number of observations during 1964, 1965, and 1967 to arrive at an average for the years 1965 and 1967; all other average values include the monthly values for 1964, 1965, and 1967 (from Thompson, 1977).

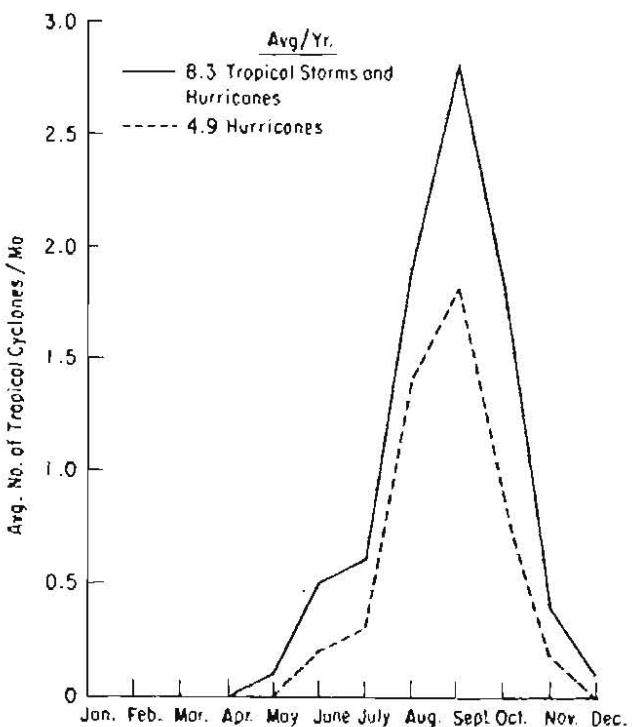


Figure 17. Average number of tropical cyclones occurring per month (1886-1977) in the North Atlantic Ocean (excluding depressions but including subtropical systems) (from National Weather Service, 1978).

hurricanes directly impact on Atlantic City (two "direct hits" from 1899-1977 were recorded by the National Weather Service, 1978). Most hurricanes remain offshore in this area, producing indirect effects such as increased wave heights. Extratropical storms, particularly northeasters, are second only to hurricanes in their destructive intensity causing considerable damage to the beaches and structures along the New Jersey coast. The resultant damage from these storms is largely due to the high winds, waves, and increased water levels they generate.

The astronomical tides at Atlantic City are semidiurnal and have been monitored almost continuously since 1912 from a primary tide station located on Steel Pier. The mean tidal range is 1.25 meters, with the normal tidal range varying from 0.98 meter for neap tides to 1.52 meters for spring tides. The highest recorded storm tide at Atlantic City, 2.32 meters above MSL (Table 2), occurred during a hurricane in September 1944. The March 1962 storm caused the second highest storm tide, 2.19 meters above MSL (Table 2). Additional information on extreme high tides and frequency of maximum monthly high tides is provided in Table 3 and Figure 18, respectively (U.S. Congress, 1964a).

The National Ocean Survey's (NOS) accepted mean tidal heights for this location, based on the timespan 1948 to 1966, referenced to the ocean MLW datum, are: mean high water (MHW), 1.25 meters; mean tide level, 0.62 meter; National Geodetic Vertical Datum (NGVD), 0.50 meter; and MSL, 0.63 meter. During the period 1912 to 1969, the apparent secular trend for the change in sea level at Atlantic City was a rise of 0.283 centimeter per year (Hicks, 1972). Approximately 0.1 centimeter per year of this change is due to the glacial-eustatic rise in sea level, with the remainder attributed to subsidence.

The seemingly minor, but never-ending changes in sea level (Fig. 19), spanning years and decades, are masked by the more dramatic changes due to the meteorological and oceanographic parameters affecting the yearly variability in sea level. These include variations in wind, currents, water temperature, salinity, river discharge, and direct atmospheric pressure (Hicks, 1972).

Table 4 provides a summary of physical characteristics relating to Atlantic City.

III. DATA COLLECTION AND ANALYSIS

1. Establishment of Profile Lines.

Seven profile lines were established along azimuths normal to the shoreline in 1962 (Fig. 1). The spacing between adjacent profile monuments generally increased from profile lines 1 to 7 with the smallest distance between profile lines 1 and 2 at 426 meters, and the greatest distance between profile lines 6 and 7 at 1.62 kilometers. Some of these monuments were, however, offset from the actual profile lines. Standard bronze Corps of Engineers' disks were placed on or near profile lines 1 to 4, and 6 in 1975, and profile lines 5 and 7 in 1976. Each monument was then referenced horizontally to the New Jersey Transverse Mercator and vertically to NGVD (sea level datum of

Table 2. Height of storm tides at Atlantic City.

Yr	Mo	Elevation to MSL (m)
1933	Jan.	1.71
1933	Aug.	1.52
1936	Sept.	1.43
1944	Sept.	2.32
1944	Nov.	1.77
1947	Nov.	1.80
1950	Nov.	2.13
1953	Oct.	1.86
1953	Nov.	1.52
1960	Sept.	1.86
1962	Mar.	2.19
1963	Nov.	1.46
1964	Feb.	1.43
1965	Jan.	1.19
1966	Jan.	1.83
1967	Feb.	1.53
1968	Nov.	1.92
1969	Nov.	1.37
1971	Aug.	2.13
1972	Dec.	1.71

Note—Data for 1933–62 from U.S. Congress (1964a); data for 1963–72 compiled by subtracting predicted tides from recorded tides (NOS) to determine highest for the year.

Table 3. Extreme high tides at Atlantic City (from U.S. Congress, 1964a).

3-yr period	Heights above MSL (m)															
	1.01	1.07	1.13	1.19	1.25	1.31	1.37	1.43	1.49	1.55	1.61	1.77	1.80	1.86	2.13	2.32
	No. of occurrences															
1936–38	205	126	77	44	25	15	7	3	1	--	--	--	--	--	--	--
1939–41	287	194	129	73	34	20	11	8	5	3	2	--	--	--	--	--
1942–44	326	213	143	89	43	28	16	10	8	4	3	2	1	1	1	1
1945–47	338	234	157	99	61	44	19	9	6	3	1	1	1	--	--	--
1948–50	290	189	126	82	46	37	21	11	5	2	2	1	1	1	1	--
1951–53	311	203	130	88	52	30	16	7	4	3	1	1	1	1	--	--
1954–56	344	233	150	98	55	38	19	13	6	1	--	--	--	--	--	--
1957–59	356	231	140	83	56	29	14	7	4	2	1	--	--	--	--	--
1960–61 ¹	409	294	213	143	96	66	51	29	18	14	12	3	3	1	--	--

¹Adjusted by fraction 3/2 to represent a 3-year period for purposes of comparison.

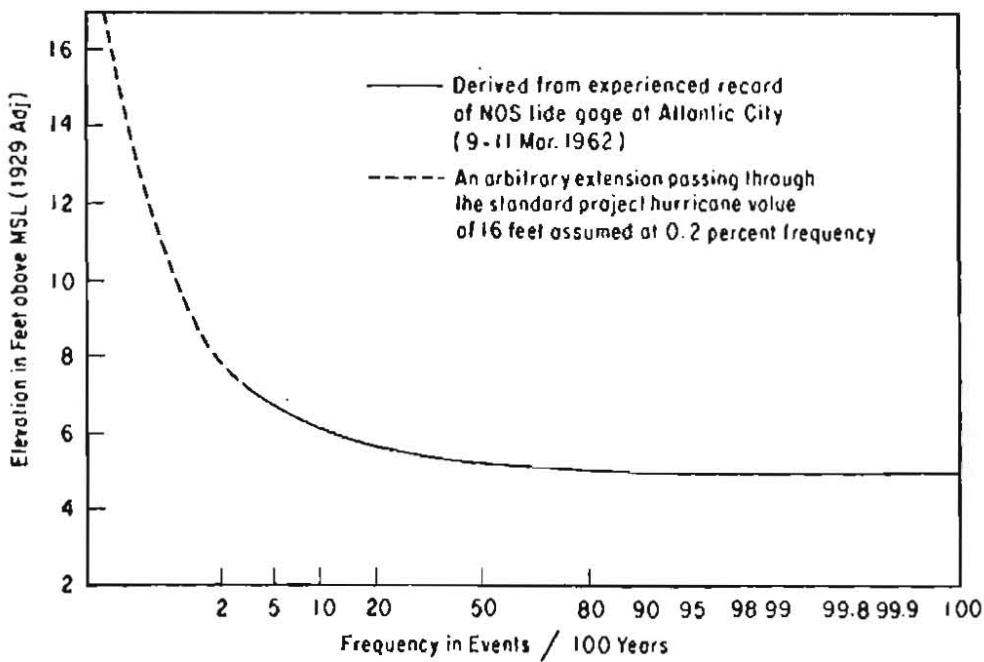


Figure 18. Frequency of maximum monthly high tides at Atlantic City (from U.S. Congress, 1964a).

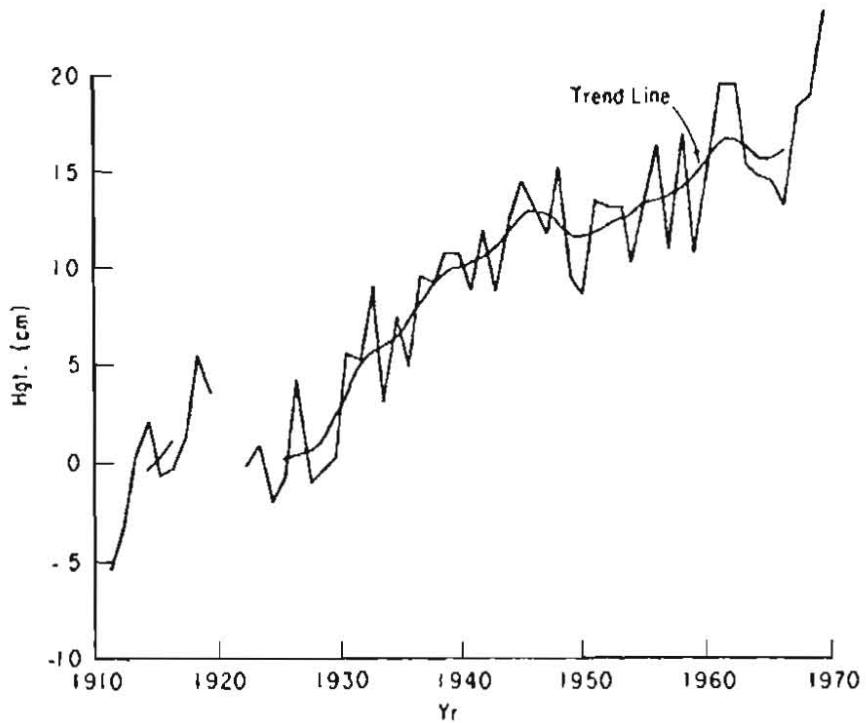


Figure 19. Change in sea level with respect to adjacent land for Atlantic City, 1912 to 1969 (Ricks, 1973).

Table 4. Summary of physical characteristics at Atlantic City.

Characteristic	Description								Source
Location	Absecon Island, 13 km long; coastline orientation of N. 64° E.								
Length of study area	5 km, from Absecon Inlet Jetty SW.								National Oceanic and Atmospheric Administration (1979)
Mean tidal range	1.25 m								National Oceanic and Atmospheric Administration (1979)
Spring tidal range	1.52 m								National Oceanic and Atmospheric Administration (1979)
Maximum storm surge ¹	2.13 m (Aug. 1971)								National Oceanic and Atmospheric Administration (1972)
Mean significant wave height	0.81 m (less than 1 pct exceed 3 m)								Thompson and Harris (1972)
Standard deviation	0.53 m								Thompson (1977)
Mean wave period	8.18 s								Thompson and Harris (1972)
Standard deviation	2.43 s								Thompson (1977)
Breaker type	44.7 pct plunging (PL) 32.0 pct spilling (SP)								Visual obsns. (Jan. 1968 to Oct. 1974)
Breaker approach	57.7 pct within 5° either side of shore-normal 33.0 pct 5° to 25° left of shore-normal								Visual obsns. (Jan. 1968 to Oct. 1974)
Beach material	Fine-to-medium grain quartz sand								Ramsey and Galvin (1977)
Median diameter	0.27 mm								Ramsey and Galvin (1977)
Profile									
Poreslope	1	2	3	4	5	6	7	Avg.	
Berm width from Boardwalk (m)	0.039	0.066	0.047	0.046	0.046	0.039	0.045	0.047	Everts, DeWall, and Czerniak (1974)
Berm height above MSL (m)	180	5	75	50	60	90	110	80	Everts, DeWall, and Czerniak (1974)
	1.3	2.3	3.0	2.4	2.2	2.1	2.0	2.2	Everts, DeWall, and Czerniak (1974)

¹During BEP program.

1929). All survey work for profile documentation was performed by the U.S. Army Engineer District, Philadelphia. Profile line documentation is discussed further in Appendix A.

2. frequency of Surveys.

The general criteria considered in establishing survey frequencies were the periods of maximum beach change caused by seasonal effects as well as weather forecasts indicating a high probability of beach erosion due to storms. Survey frequency was greatest during the fall and winter months with a particularly large number of surveys taken during the first quarter of 1963, at the beginning of the project, and in 1968-70 when a series of 10 weekly surveys was done. Figures 20 and 21 show the number of surveys at Atlantic City by quarter (3 months) and by month, respectively.

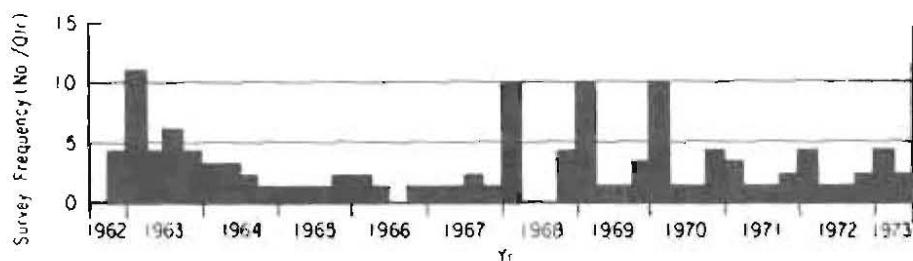


Figure 20. Frequency of surveys at Atlantic City.

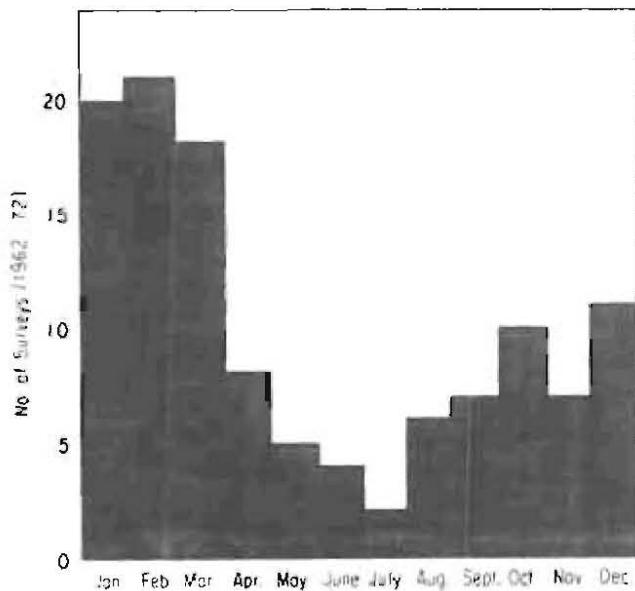


Figure 21. Total number of beach profile surveys, by month, at Atlantic City.

Surveys were initially intended to be conducted every 2 weeks and after significant storms. However, an examination of the initial surveys showed that the engineering significance generally associated with beach changes in a 2-week period was of limited value. Therefore, the interval between regularly scheduled surveys was extended to 1 month or even longer during the summer.

3. Field Survey Technique.

The general data collection procedure consisted of setting up a surveyor's level at or near a previously established point of known elevation or "bench mark," usually located on the seaward side of the Boardwalk (Figs. 22 and 23). Then, using a tape and Philadelphia rod, readings were taken along each profile line at approximately every 15 meters or at breaks in slope. Profile alignment was maintained by sighting on preestablished predominant landmarks such as telephone poles or buildings along the Boardwalk. Horizontal distances were recorded to the nearest 0.3 meter and elevations to the nearest 0.03 meter, except when hand leveling was used.



Figure 22. Surveying crew setting up for another reading (16 January 1968).

When the Philadelphia rod reached an elevation where it was out of view through the level, the general procedure was to hand level down to the surf with the rodman wading out as far as possible. Occasionally, the rod was "boosted" (or raised) a known distance to the top of the rodman's boot or belt to obtain the last point without hand leveling. Turning points were also used; however, before 1972 the leveling was not closed back to either the turning points or to the starting bench mark, so the reliability of the turning points could not be determined.

The surveying party consisted of a six-man hydrographic surveying crew from the Philadelphia District, except for a period in 1963 and 1964 when a private firm was contracted to do the work. The six-man crew either worked as



Figure 23. Rodman in the surf (16 January 1968).

a single crew or split into two three-man crews to expedite the work. The crew also collected sand samples at various times at selected profile lines.

In addition to surveys by conventional surveying methods, an experimental program was conducted to test a method of obtaining profiles by observing sand levels on pipes located at approximately 15-meter intervals along selected profile lines (Urban and Galvin, 1969). Profile lines 5 and 7 at Atlantic City were selected for this program.

To establish the pipe profiles, 6.4-meter-long iron pipes (marked at 0.15-meter intervals and usually marked before emplacement) with 3.8-centimeter (inside) diameters were jetted 4 meters into the sand. A type of reflecting material or a sign was displayed on the pipes as a safety measure for beach buggy traffic at night.

Unpaid local observers enlisted by the Philadelphia District made weekly observations of the sand elevation at each pipe. These observations were recorded on forms and mailed weekly to CERC. At CERC, the sand elevations were converted to elevations above MSL and the data were stored in the standard survey format. These data are available in Urban and Galvin (1969).

4. Accuracy of Field Surveys.

A certain degree of error is inherent in any data collection procedure, even under the most ideal conditions. Some of the possible errors encountered throughout these surveys are discussed below.

Random reading errors were minimized by using a rod graduated in tenths of a foot. Since the only readings requiring a greater precision (to the nearest hundredth of a foot) were at the bench mark and at turning points, and these sight lengths were usually less than 76 meters (250 feet), no significant random error should occur (Czerniak, 1972).

Systematic errors due to condition of the level, rod out of plumb, temperature of tape, slope of tape, and tape not on line were considered insignificant and had no great effect on the data collected. Bad turning points undoubtedly resulted in some error, but since the leveling was not closed back to the bench mark, there is no definite method of determining specifically when an error might have occurred or to what extent. Another source of systematic error results from the sag of the tape and wind effects on taping. The magnitude of this error is assumed to be an average maximum of -0.1 foot per 200 feet of tape length.

Taking into account these error possibilities and various other errors due to human and environmental causes, the data were considered "accurate" if every point on the profile was within ± 0.05 foot vertically and ± 0.5 foot horizontally of the actual values. The data were also considered "dependable" if sufficient checks on the survey data were performed to ensure that no personal errors affected the data. Based on these criteria, it was concluded that the data obtained were of acceptable accuracy and dependability.

5. Data Reduction and Quality Control.

Until 1968, survey data were recorded in field notebooks, reduced and hand-plotted by the surveyors, and then forwarded to CERC. These plots were later digitized and placed in a punchcard format. After 1968, the survey data were still recorded in fieldbooks, but the data were then transferred to optical scanning forms before being sent to CERC. At CERC the data were logged and scanned with an optical mark page reader (OMPR) to produce punchcards. The cards were then read into a computer where the data were processed using an editing program which plotted profile points. From these plots, apparent errors were identified and returned to the surveyors for correction or comment. A final edit check was made and the data were stored in a magnetic-tape format when all detectable errors were satisfactorily corrected.

A quality control study by Czerniak (1973) indicated a 25 percent probability that there would be an error of ± 0.1 foot in the recorded elevation of a surveyed point due to rounding by the survey party in the field. Because of the improbability of this rounding error occurring numerous times on the same profile, this error, if present, should have no adverse affect on any data analysis.

Figure 24 diagrams the basic steps taken throughout the BEP program from the initial observation in the field to the final computer output.

Appendix B provides a tabulation, by profile, of all the survey data collected during the study.

6. Data Analysis.

Two primary parameters calculated from the profile data are (a) the change in MSL shoreline (ΔS) and (b) the change in unit storage volume (ΔV). The first parameter, ΔS , is the horizontal change, between surveys, of the position of MSL at a profile line. If the beach at MSL prograded during the time between surveys, a positive number would result for ΔS ; a negative value would result if the beach receded. The second parameter, ΔV , is the change in volume above MSL between two surveys for a unit width parallel to the shoreline at a profile line. If accretion occurs between surveys, ΔV will have a positive value, and if erosion occurs, ΔV will be negative.

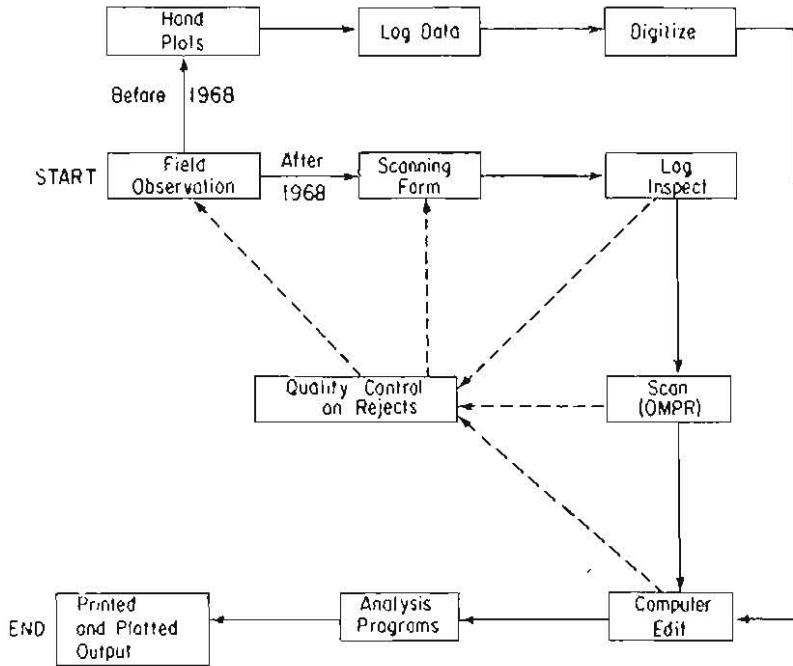


Figure 24. BEP data processing.

The values for ΔS and ΔV are limited in two significant ways (see Figs. 25 and 26). The lower limiting elevation of the surveys for computational purposes is MSL and therefore the values do not provide any indication of changes below MSL. The volume computations are also based on a landward boundary, common to most of the surveys, for each profile line. As a result of these two limiting factors, there generally exists a landward region of change as well as the probably more substantial below-MSL region of change which are not included in the computed volume.

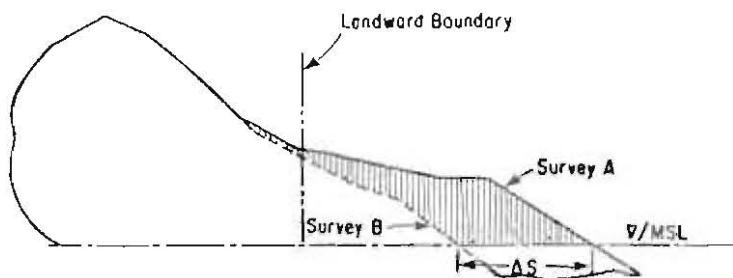


Figure 25. Change in MSL shoreline at profile line, ΔS .

IV. RESULTS

1. Short-Term Changes.

a. Changes During Storms. Storms contribute substantially to short-term beach profile changes by their very nature of short duration and high

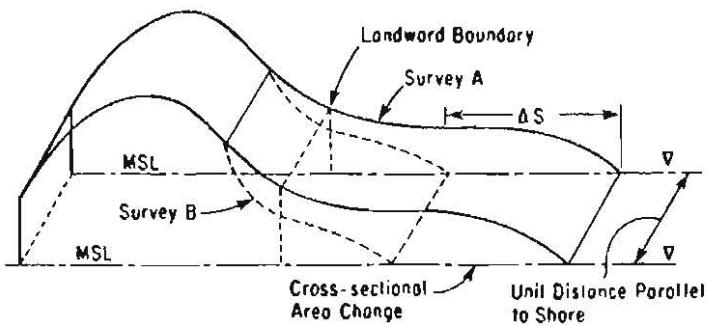


Figure 26. Change in unit storage volume at profile line, ΔV .

intensity. Seventeen storms, predominantly northeasters, were selected for analysis based on the following criteria (see Table 5):

- (1) Existence of prestorm surveys no more than 4 weeks before the storm and poststorm surveys no more than 1 week after the storm;
- (2) data indicating wave heights of 1.22 meters or greater during the storm (this value was arbitrarily chosen due to the 0.85-meter value for mean wave height determined by Thompson and Harris, 1972); and
- (3) no other known significant weather events occurring between surveys.

Visual observations indicate that the predominant breaking wave directions during storms are from the east and southeast. Wave breaker types most commonly observed were either plunging or spilling (Urban and Galvin, 1969). Analysis of the selected storms for which actual tide data were available demonstrated an average maximum storm-generated surge at high water of 0.57 meter.

An effect which must be considered is the timelag between the storm and the poststorm survey which varies from 0 to 6 days. The greater the lag, the more probable that the beach has already begun recovering, thereby not indicating the total storm change (Birkemeier, 1979). (See App. C for plots of prestorm and poststorm surveys.)

Figure 27 depicts the mean and standard deviation of unit volume changes above MSL, by profile, for the selected storms. Due to the relatively few storms analyzed, this information provides only a possible trend of unit volume changes at each profile line. Profile lines 2, 5, 6, and 7 underwent the greatest average unit volume loss of 6 cubic meters per meter or greater during these storms. This is partly explained by the fact that the general direction of longshore transport during storms is from northeast to southwest in this area. Consequently, profile lines 2 and 5 are in littorally depleted locations as a result of updrift groins and other manmade obstructions to littoral drift (see Fig. 3). However, profile lines 6 and 7 are on relatively unobstructed beach, so their changes in unit volume are presumably due to onshore-offshore sand movement, or possibly movement downshore into the unsurveyed part of Absecon Island.

The wide deviation at profile line 1 is undoubtedly a direct consequence of its location immediately downdrift of the Absecon Inlet jetty. Profile line 4, on the other hand, indicates a zero average unit volume change in

Table 5. Atlantic City storm data.

Storm date	Survey dates	Days before survey (no.)	Days after survey (no.)	Max. MSL surge		Date of max. MSL surge	MSL surgeas 20.61 ± 20.3 m	MSL surges ≥ 0.3 m	Max. wave hgt.		Source	Dates of max. wave hgt.	MSL shoreline chg.		Above MSL unit vol. chg.	
				(m)	(ft)				(m)	(ft)			avg. ¹ (m)	std. dev. ¹ (m)	avg. ¹ (m ³ /m)	std. dev. ¹ (m ³ /m)
13 Jan. 1964	31 Dec. 1963 to 17 Jan. 1964 ²	13	4	0.66	2.17	13 Jan. 1964	1	3	3.96	13.00	Gage	-----	2.72	4.89	-20.40	25.23
23 Sept. 1964	31 Aug. 64 25 Sept. 1964 ²	23	2	0.23	0.77	22-23 Sept. 1964	0	0	4.86	16.03	Gage	-----	-2.68	12.99	-22.99	22.07
16 Sept. 1967	15-19 Sept. 1967	1	3	0.73	2.38	16 Sept. 1967	1	2	2.74	9.00	Gage	-----	-5.90	10.70	-8.18	25.63
25 Jan. 1968	24-30 Jan. 1968	1	5	0.54	1.78	25 Jan. 1968	0	3	1.22	4.00	Visual	26 Jan. 1968	0.14	5.11	-5.82	9.56
8 Feb. 1968	30 Jan. to 8 Feb. 1968 ²	9	0	0.66	2.18	8 Feb. 1968	1	1	1.98	6.50	Visual	8 Feb. 1968	-0.27	4.48	-6.02	7.86
25 Feb. 1968	21-26 Feb. 1968	4	1	0.24	0.78	25 Feb. 1968	0	0	1.22	4.00	Visual	25 Feb. 1968	-5.90	13.19	-0.32	5.93
1 Mar. 1968	26 Feb. to 7 Mar. 1968	4	6	0.63	2.08	29 Feb. 1968	1	1	1.83	6.00	Visual	1 Mar. 1968	1.83	11.00	1.88	3.35
13 Mar. 1968	7-13 Mar. 1968	6	0	0.45	1.48	12 Mar. 1968	0	1	1.83	6.00	Visual	8 Mar. 1968 20-25 Jan. 1969	-4.90	8.19	-2.33	9.75
22 Jan. 1969	13-22 Jan. 1969	9	0	0.38	1.26	21 Jan. 1969	0	3	1.52	5.00	Visual	21-22 Jan. 1969 9 Feb. 1969	-3.83	8.33	-12.64	9.52
10 Feb. 1969	5-12 Feb. 1969	5	2	0.51	1.66	9 Feb. 1969	0	1	1.22	4.00	Visual	9 Feb. 1969	-2.03	5.17	0.73	7.19
18 Feb. 1969	12-19 Feb. 1969	6	1	0.48	1.56	18 Feb. 1969	0	4	1.52	5.00	Visual	18-19 Feb. 1969 28 Feb. 1969	0.40	6.24	-5.48	11.10
2 Mar. 1969	26 Feb. to 5 Mar. 1969	4	3	0.75	2.46	2 Mar. 1969	3	10	2.73	8.96	Gage	27 Feb. to 3 Mar. 1969	6.99	8.65	-11.01	23.96
7 Mar. 1969	5-12 Mar. 1969	2	5	0.48	1.56	7 Mar. 1969	0	3	1.22	4.00	Visual	7-8 Mar. 1969	-3.43	7.17	5.10	11.30
11 Dec. 1969	20 Nov. to 16 Dec. 1969	21	5	No tide data	-----	No tide data	---	---	1.37	4.50	Visual	9 Dec. 1969	0.80	10.16	2.33	14.11
17 Dec. 1970	9-16 Dec. 1970 ²	8	1	0.91	3.00 ³	-----	---	---	3.05	11.00	Gage	17 Dec. 1970	3.60	10.14	+1.21	30.70
19 Feb. 1972	14-22 Feb. 1972	5	3	1.07	3.50	19 Feb. 1972	1	5	2.13	7.00 ⁴	Visual	19 Feb. 1972	2.64	6.89	+14.83	14.39
32 Mar. 1973	16-25 Mar. 1973 ²	6	2	0.78	2.57	22 Mar. 1973	4	8	1.37	4.50 ⁴	Visual	22 Mar. 1973	11.80	7.47	-11.60	25.23
Avg.		7.47	2.53	0.57	1.88		0.8	3	2.08	6.33						

¹Simple average of profile values (negative values indicate recession-erosion).²Not all profiles reached MSL.³Data from Sandy Hook, New Jersey.⁴Data from Ludlam Island, New Jersey.

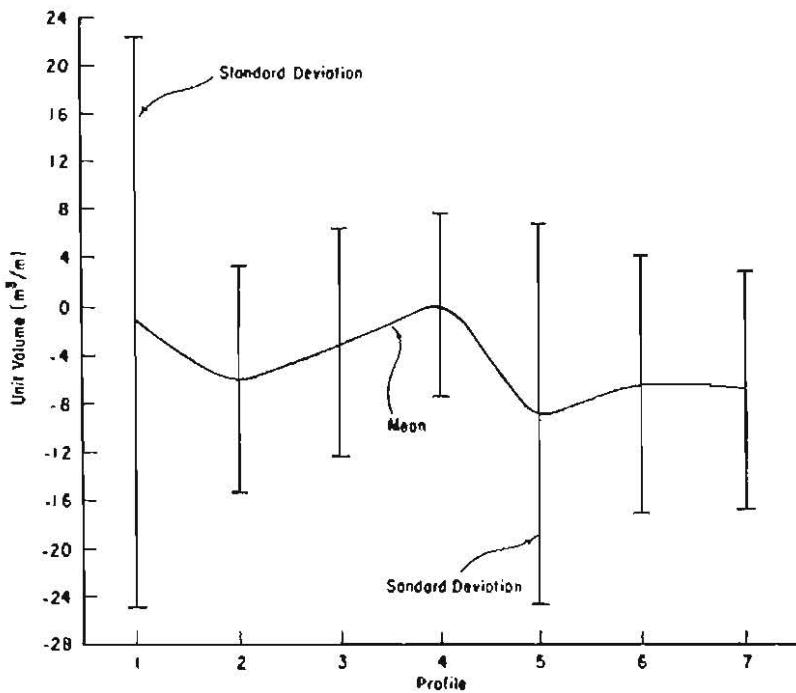


Figure 27. Mean and standard deviation of unit volume changes by profile for 17 selected storms at Atlantic City.

addition to having the smallest deviation of all profiles. Profile line 4, therefore, appears to maintain a reasonably stable unit volume throughout storms. This apparent anomaly may possibly be related to the number and type of structures near the profile; i.e., Steel Pier and Steeplechase Pier updrift of the profile, as well as two groins located on either side of Steel Pier (Table 1). In addition, another groin located just downdrift of the profile causes a "boxed-in" effect which could possibly contain a bulk of the littoral material.

Figure 28 illustrates the mean unit volume changes and standard deviations by contour above MSL for all profile lines during the selected storms. The greatest average unit volume loss occurs between the +0.5- and +1.0-meter contours. The figure also shows that the greatest deviations from the mean occur between the 0.0- and +2.0-meter contours. This is to be expected because wave action is concentrated in the foreshore region and thereby lends to greater variations in volumes of material moved. Also, it is possible that the maximum average unit volume loss occurs between the +0.5- and +1.0-meter contours because the average maximum surge above high water, which allows waves to concentrate, during those storms is 0.57 meter. Alternately, the variation in volume change generally decreases with increasing elevation above +2.0 meters because this part of the profile remains relatively stable, except in severe storms, due to its increased distance from the scouring effects of wave action. This higher part of the beach not only remains relatively stable, but it accretes an average of 0.21 cubic meter per meter per storm between the 3.0- and 3.5-meter contours.

Since losses from the lower contours clearly exceed gains along the upper contours, sand is moving either offshore or alongshore. The most intense storms resulted in -20 cubic meters per meter volume changes above MSL, which

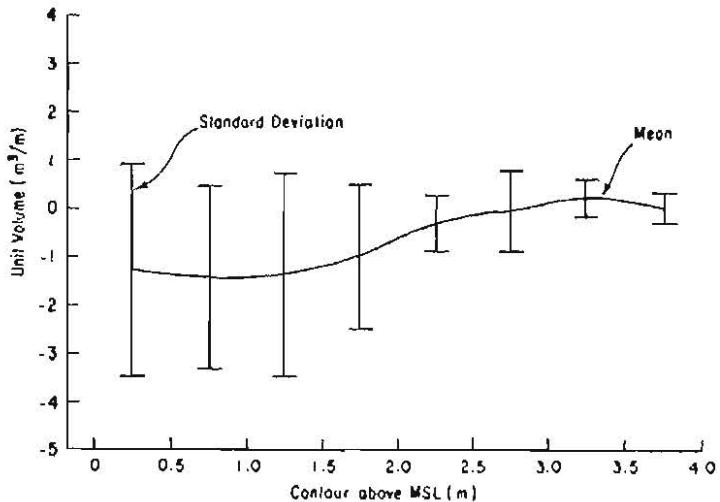


Figure 28. Mean and standard deviation of unit volume changes by contour for 17 selected storms at Atlantic City profile lines.

is -100,000 cubic meters over the 5-kilometer study area compared to the gross annual longshore transport rate of about 500,000 cubic meters (for the entire littoral zone); this short-term beach erosion indicates that most of the sediment transport during storms is offshore.

In Figure 29 the unit volume changes at each profile, as determined from prestorm and poststorm survey data, are compared to the changes in MSL shoreline position (0.0 contour) for the same storm data. In this way, volume changes resulting in accretion and erosion are compared to shoreline changes resulting in progression (advancement) and recession (retreat). Figure 30, which depicts trends in volume change versus shoreline change for selected storms, shows considerable differences between these two values, indicating, at least during storms, that volume accretion is not necessarily accompanied by MSL shoreline progression nor is volume erosion always accompanied by MSL shoreline recession. These data demonstrate the need for caution when evaluating short-term beach changes from aerial photos.

b. Beach-Fill Changes. Two major beach-fill projects at Atlantic City during the BEP study (in 1963 and 1970) used a combination of stockpiling and direct placement. Stockpiling entails periodically placing beach material at a concentrated updrift location in the depleted area, and allowing natural processes to move the fill downdrift to nourish the beach. Direct placement involves placing the fill along the entire area to be nourished.

As mentioned previously, the 1963 fill project consisted of 428,000 cubic meters of fill placed between Oriental and Virginia Avenues to replenish the greatly eroded beach resulting from the March 1962 storm. Figures 31 and 32 indicate the 1963 and 1970 beach-fill limits and the beach profiles before and after both fills. Figure 33 shows the unit volume change from 1963 to 1972 for each profile line. These data indicate that the 1963 fill remained for approximately 4 years on profile line 3 and provided nourishment to profile lines 4 to 7 at later times as a result of natural processes, as indicated by the dashline tracing volume increases along the profile lines. However, those same natural processes caused a continued erosion problem that required the

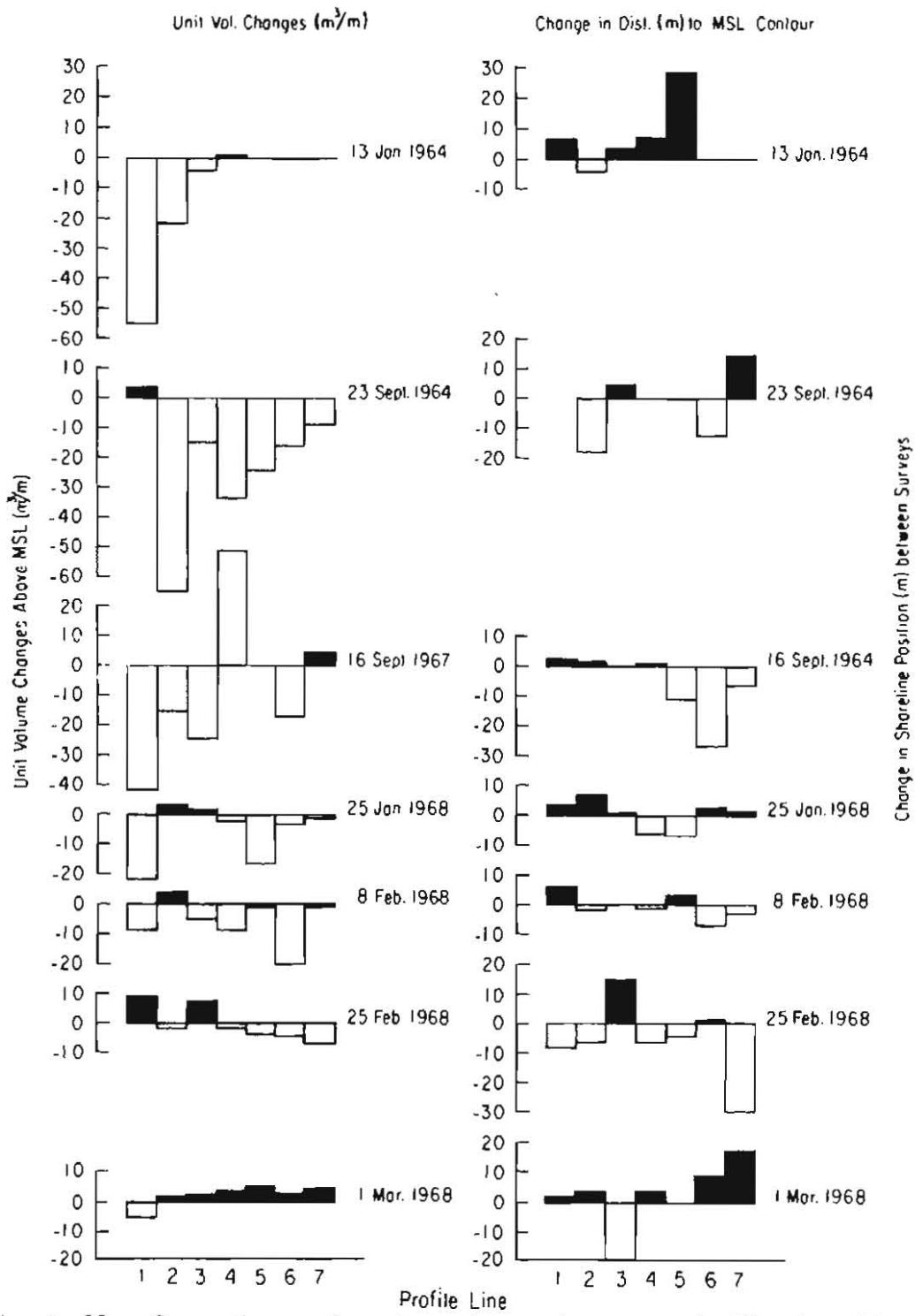


Figure 29. Comparison of unit volume changes and MSL shoreline position changes by profile for 17 selected storms.

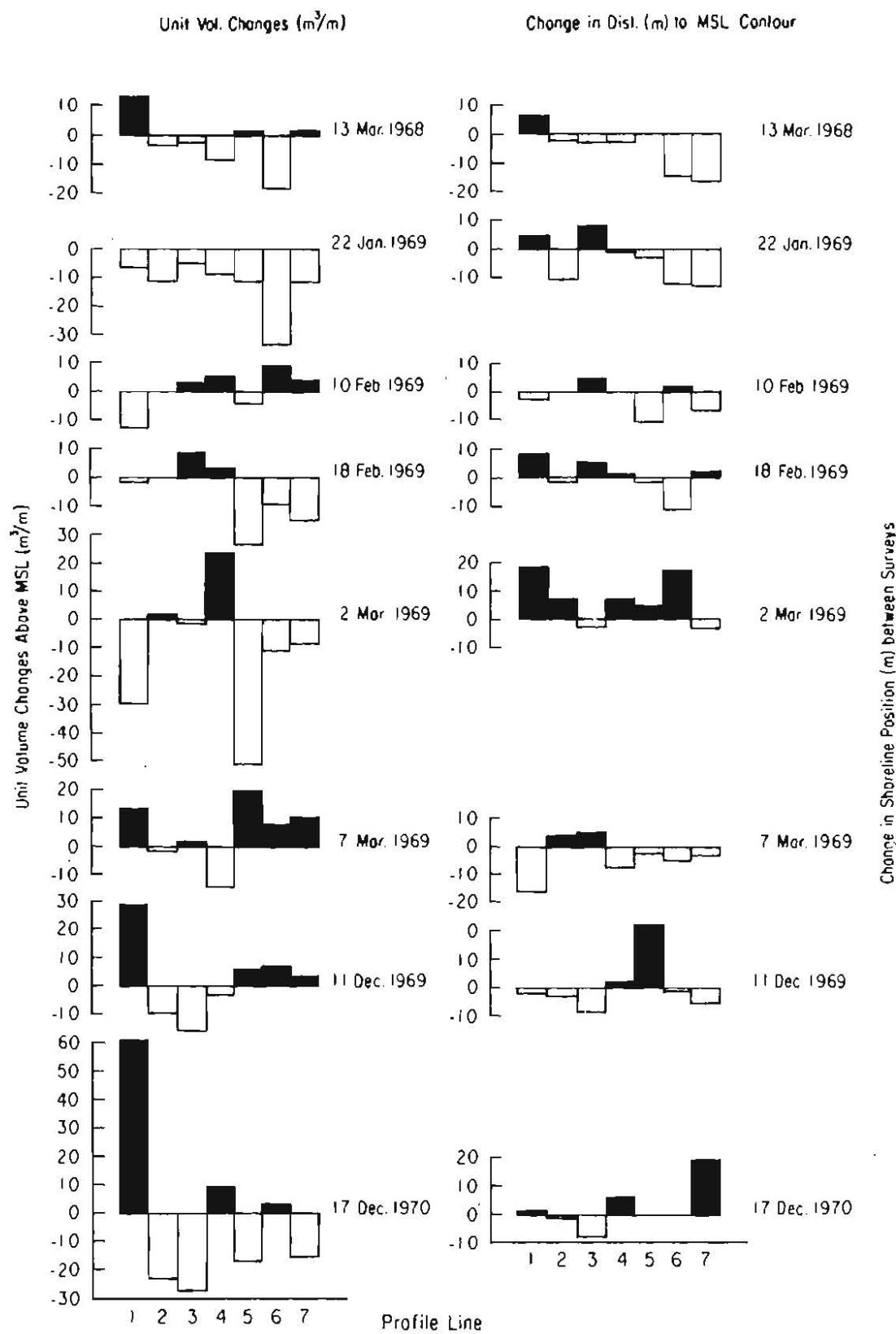


Figure 29. Comparison of unit volume changes and MSL shoreline position changes by profile for 17 selected storms.--Continued

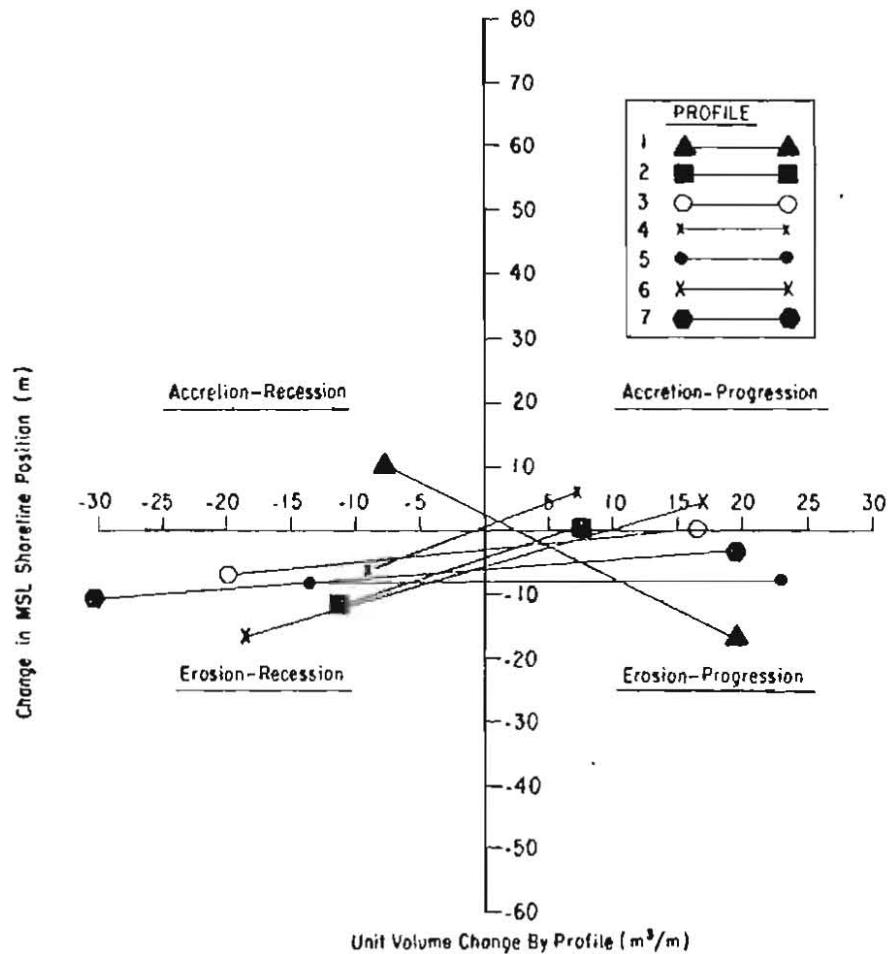


Figure 30. Trends in volume change versus shoreline change for 17 selected storms.

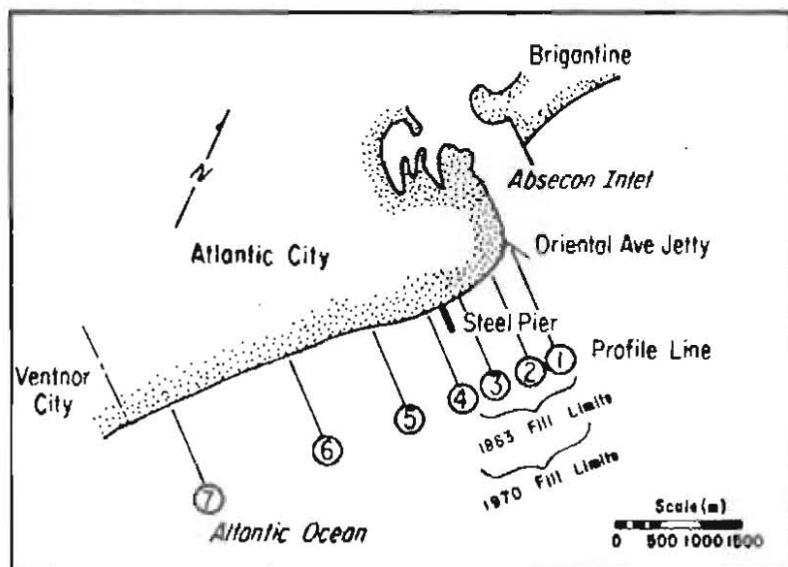


Figure 31. Limits of 1963 and 1970 beach fills at Atlantic City (Everts, DeWall, and Czerniak, 1974).

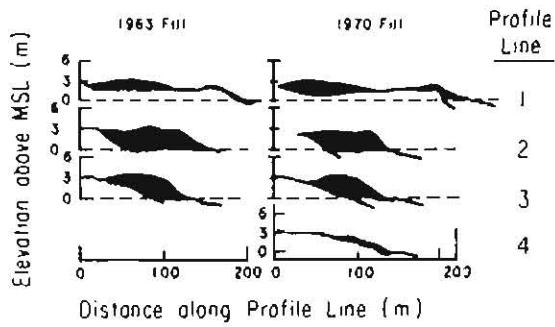


Figure 32. Cross section of beach from profiles taken before and after beach nourishment in 1963 and 1970 (from Everts, DeWall, and Czerniak, 1974).

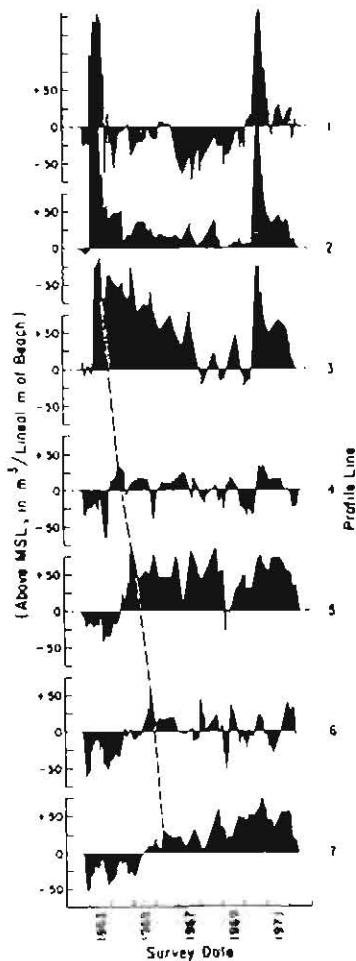


Figure 33. Sediment volume measurements between surveys relative to first survey ("zero" unit volume is the volume during the first survey in October 1962). Dashline indicates probable alongshore movement of some volume of the beach fill as determined by volume increases along profile lines 4 to 7 (Everts, DeWall, and Czerniak, 1974).

placement in 1970 of an additional 635,000 cubic meters of beach material between Oriental and Illinois Avenues (see Figs. 31 and 32). The fill material in each case was similar to the natural beach material, with a mean grain size of 0.3 millimeter. Again in 1970, profile line 3 indicated a trend to maintain much of the fill for an extended time period (Fig. 33). Although surveys were not conducted after 1973, it can be assumed that some of the fill migrated down the beach to the other profile lines as did some of the 1963 fill. Some information supporting this assumption is shown by comparing the photos in Figures 34 and 35 (taken in November 1970) with the photos in Figures 36, 37, and 38 (taken in March 1979 at profile line 2). Note the considerable amount of beach after the beach fill in 1970, compared to the practically nonexistent beach in 1979. Also, note the wide beach in Figure 39 (taken at profile line 6 in March 1979) compared to the lack of beach in Figures 36 and 37.

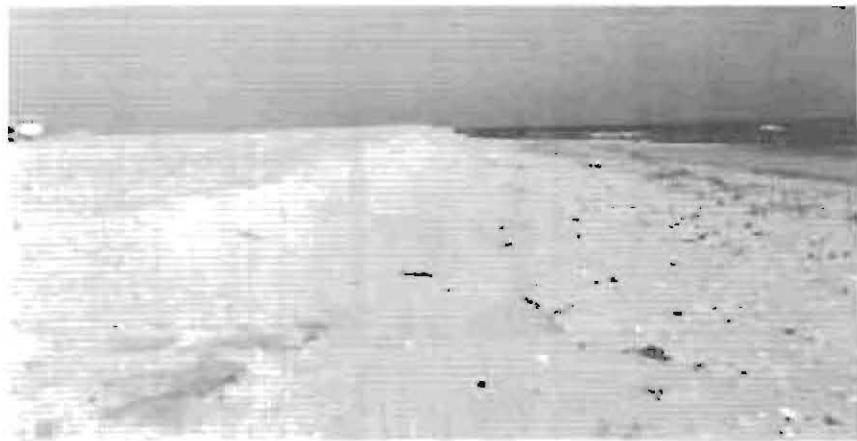


Figure 34. View of scarp just north of profile line 2 (24 November 1970).



Figure 35. View landward from waterline at profile line 2. Building at left, behind Boardwalk, is convalescent home shown in Figure 38 (24 November 1970).



Figure 36. View of groin at Vermont Avenue from under the Boardwalk at Rhode Island Avenue (profile line 2) (9 March 1979).

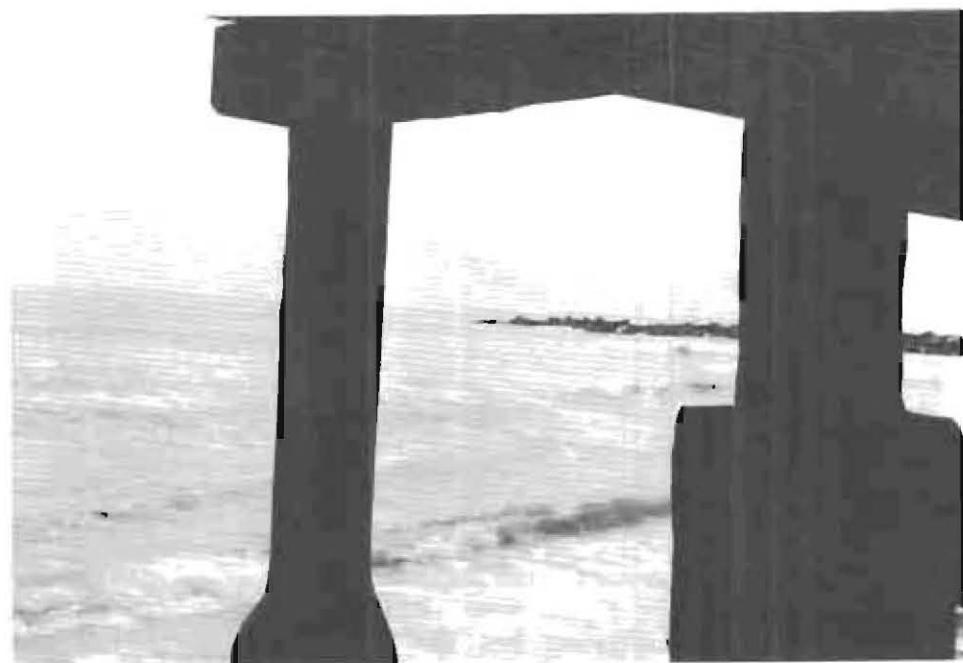


Figure 37. View of groin south of Rhode Island Avenue from under the Boardwalk at profile line 2 (9 March 1979).



Figure 38. View of erosion-scour at the base of the convalescent home on the south side of Rhode Island Avenue (8 March 1979).



Figure 39. Looking shoreward from waterline at California Avenue (profile line 6) on 9 March 1979. Note width of beach compared to that at profile line 2 in Figures 23 and 34.

Additional short-term changes that primarily affect the upper sections of the profiles result from the periodic removal of sand from under the Boardwalk (see Figs. 40, 41, and 42) for use as fill elsewhere on the beach (see Fig. 43). Although this procedure has been observed, it is not well documented in terms of frequency or quantities of material transferred. The project during the winter and spring of 1979 was done by the City and called for the removal of 36,600 cubic meters of sand from under the Boardwalk near profile line 7 (Richmond to Raleigh Avenues) (M. Ingram, City Engineer, personal communication, March 1979). This material was then placed on the foreshore midway between profile lines 4 and 5. Because of the relatively fine size of this well-sorted sand (0.18 millimeter compared with 0.27 millimeter reported by Ramsey and Galvin, 1977, for average foreshore sand size in March), the material would probably be easily eroded from the beach face.



Figure 40. Borrow site under Boardwalk at Richmond Avenue on 9 March 1979. Note amount of sand removed by comparison to sand still evident behind and under Boardwalk (compare also to Fig. 39).



Figure 41. Trucks waiting to be filled with sand near Raleigh Avenue (9 March 1979).



Figure 42. Front loader filling truck with sand excavated from under the Boardwalk near Raleigh Avenue (9 March 1979).



Figure 43. Site of beach fill near St. James and New York Avenues (9 March 1979).

2. Long-Term Changes.

Long-term changes include the cyclic seasonal changes (U.S. Army, Corps of Engineers, Coastal Engineering Research Center, 1977) along with longer range trends which may or may not be cyclic in nature. Changes in the MSL shoreline position during 1962-73 are shown in Figure 44. The 1963 and 1970 beach fills are evident on profile lines 1, 2, and 3 with subsequent progradation on the downdrift profiles, which was also shown in the unit volume changes (Fig. 33). Figure 45 depicts the average unit volume and MSL shoreline position by month for each of the profile lines. The mean of the monthly averages for each profile is indicated by the "zero" unit volume, whereas the "zero" MSL shoreline position is the shoreline position during the first survey. Figure 45 shows that seasonal changes do occur at Atlantic City, with the least volume of sand on the beach from January to March and the greatest volume of sand generally from June to August. This large quantity of sand also appears predominantly on profile lines 1, 2, and 3 with profile lines 5, 6, and 7 showing a loss of sand during June and July. These extremely large volumes at profile lines 1, 2, and 3 predominantly reflect the beach fill of 1963 in which the bulk of the fill material was placed along these profile lines as shown in Figure 32. These values may also be misleading since only four surveys were conducted in June and two in July throughout the 11-year study period, with each of the profile lines surveyed twice during June, July, and August of 1963 after the 1963 beach fill. June and July were the least surveyed months during the study period (Fig. 21). In addition, all profile lines were surveyed in August 1970 after the 1970 beach fill, thereby adding a bias to the six surveys conducted in August throughout the study. Therefore, the information for these months is less representative of average summer conditions.

To evaluate the entire Atlantic City locality as a whole, ΔS and ΔV were averaged by year in the alongshore direction. The averaged alongshore change in MSL shoreline, $\bar{\Delta}S$, is computed by summing the alongshore distance-weighted yearly average values of ΔS at each profile line and dividing by the total length of the study area. Similarly, the averaged alongshore change in storage volume, $\bar{\Delta}V$, is computed using the alongshore distance-weighted values of ΔV (Czerniak, 1974).

A comparison of the mean yearly changes in storage volume and MSL shoreline (Fig. 46) shows that the long-term trends are influenced more by the magnitude of the accretion-erosion and progression-recession occurring in these years than by the number of net accretionary or erosional years. This is clearly indicated by the high dependency on the two artificial beach fills in 1963 and 1970 for the shape of the cumulative yearly change in storage volume, $\bar{\Delta}V$ (Fig. 46). In conjunction with this, yearly changes in the MSL shoreline and storage volume vary considerably and appear to suggest no clear pattern.

Figure 47 shows the changes in unit volume and shoreline position for the years between the beach nourishment projects in 1963 and 1970. The slope of a least square fit line drawn through the points on the plot of cumulative average yearly change in storage volume for the seven profile lines (Fig. 47) provides a single number which best describes the rate of "natural" change in the above MSL storage volume during this period. The line only provides a general description of the trend in the data due to the wide yearly variation

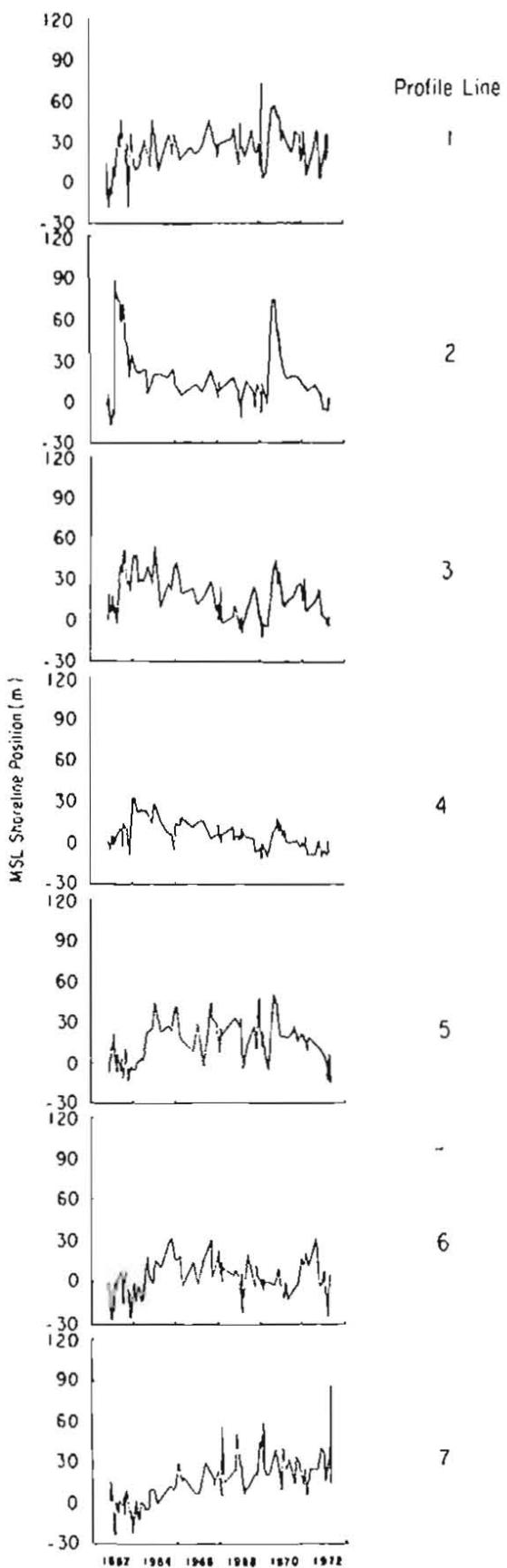


Figure 44. MSL shoreline changes in time (missing data shown by dashline).

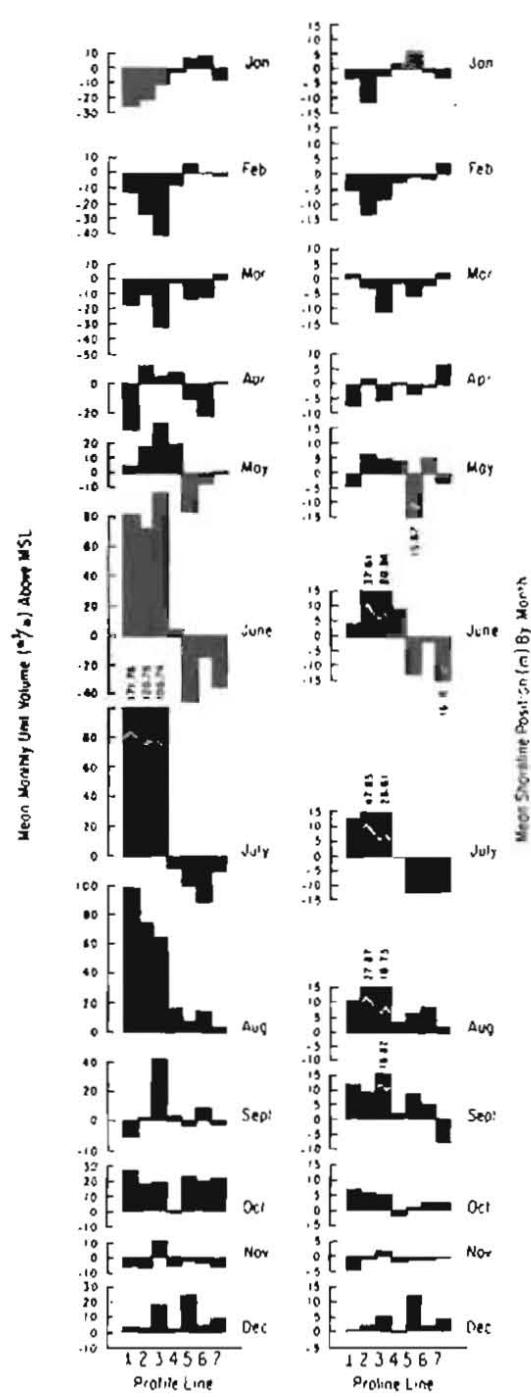


Figure 45. Mean above MSL unit volume changes and MSL shoreline position changes by month (24 October 1962 to 1 May 1973).

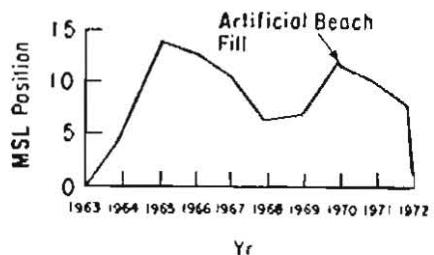
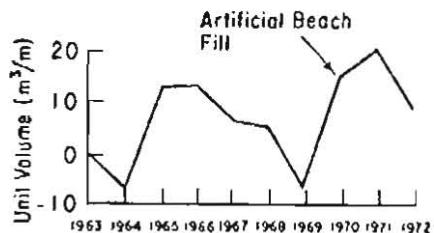


Figure 46. Cumulative yearly change in unit volume and MSL shoreline at Atlantic City.

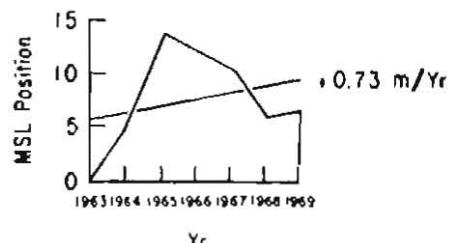
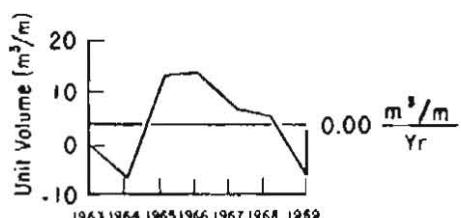


Figure 47. Long-term changes in unit volume and MSL shoreline from 1963-69 to eliminate effects of 1970 beach fill.

(Fig. 33). Under these conditions, Figure 47 indicates that Atlantic City has remained stable at 0.00 cubic meter per meter per year change above MSL during the period from 1963 to 1969.

Applying the same procedure to the change in MSL shoreline over the same period, the rate of change in the MSL shoreline indicates a progression of 0.73 meter per year. However, this line likewise represents only a general trend and only roughly approximates the actual rates of change in MSL shoreline for the locality.

Further information on the MSL shoreline changes and the above MSL unit volume changes through time by profile line is provided in Appendixes D and E, which are large-scale figures by profile of Figures 44 and 33, respectively.

V. DISCUSSION

1. Profile Changes.

In a study by the Beach Erosion Board (1950), various shoreline positions from 1841 to 1947 were compared to determine a trend in shoreline advance and retreat along the beaches at Atlantic City. It was found that considerable shoreline retreat occurred at the inlet entrance from 1841 to 1936. After 1936 the inlet shoreline remained reasonably stable due to the installation of protective structures such as bulkheads and groins. The greatest natural change at the inlet entrance from 1936 to 1947 was a progressive lowering of the beach.

The ocean shoreline beginning 300 meters northeast of Garden Pier and extending 1.2 kilometers southwest to Central Pier receded between 1936 and 1947 with a greatly accelerating rate after 1939 (Fig. 48). After the placement of a beach fill in 1948, from July 1948 to August 1960, the shoreline between the Oriental Avenue jetty and New Hampshire Avenue experienced progression ranging from a maximum of about 52 meters at the jetty to about 6 meters at New Hampshire Avenue. During this same period the shoreline between New Hampshire Avenue and Steel Pier receded, with few exceptions, from a maximum of about 40 meters between Vermont and Rhode Island Avenues to a maximum of 3 meters in the region east of Steel Pier. The recession between Vermont and Rhode Island Avenues duplicated the shoreline position of 1936 (Fig. 48).

Surveys in July and October 1948, February and May 1949, January 1950, December 1958, August 1959 and 1960, and March 1962 provide detailed profile data for the area between the Oriental Avenue jetty and Steel Pier (U.S. Congress, 1964b). There are no indications, from the previous data, of any definite quantitative trends in volumetric changes along this reach extending from the Boardwalk to approximately 1.8 meters below MLW. Likewise, for the 11-year BEP study, there appears to be no clearly defined trend in volumetric changes throughout the seven selected profiles. The two most significant events are the 1963 and 1970 beach fills and the natural transport of that material downdrift, as shown in Figure 33.

Figure 49 depicts four sets of profiles of the beach and offshore regions from January 1936 to February 1948 (before the 1948 beach fill). These profiles indicate that relative stability increases with distance southwest from the Oriental Avenue jetty and Absecon Inlet.

Profile envelopes for each profile line throughout the study period (App. F) depict the entire range of maximum and minimum elevations surveyed at given distances along the profile line and do not appear to indicate any clear trend to greater stability from profile line 1 to profile line 7.

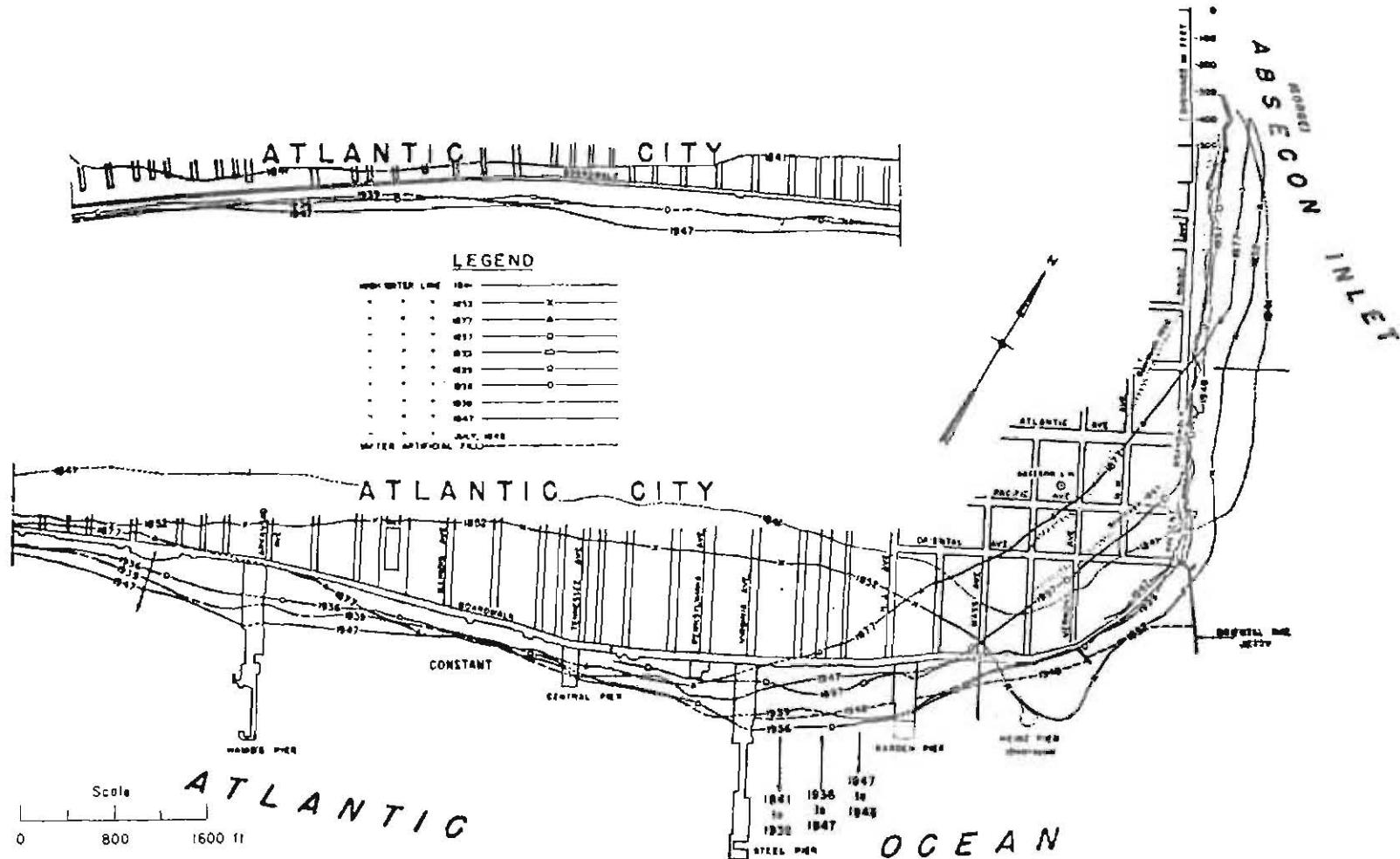


Figure 48. Shoreline changes at Atlantic City, 1841-1948 (Beach Erosion Board, 1950).

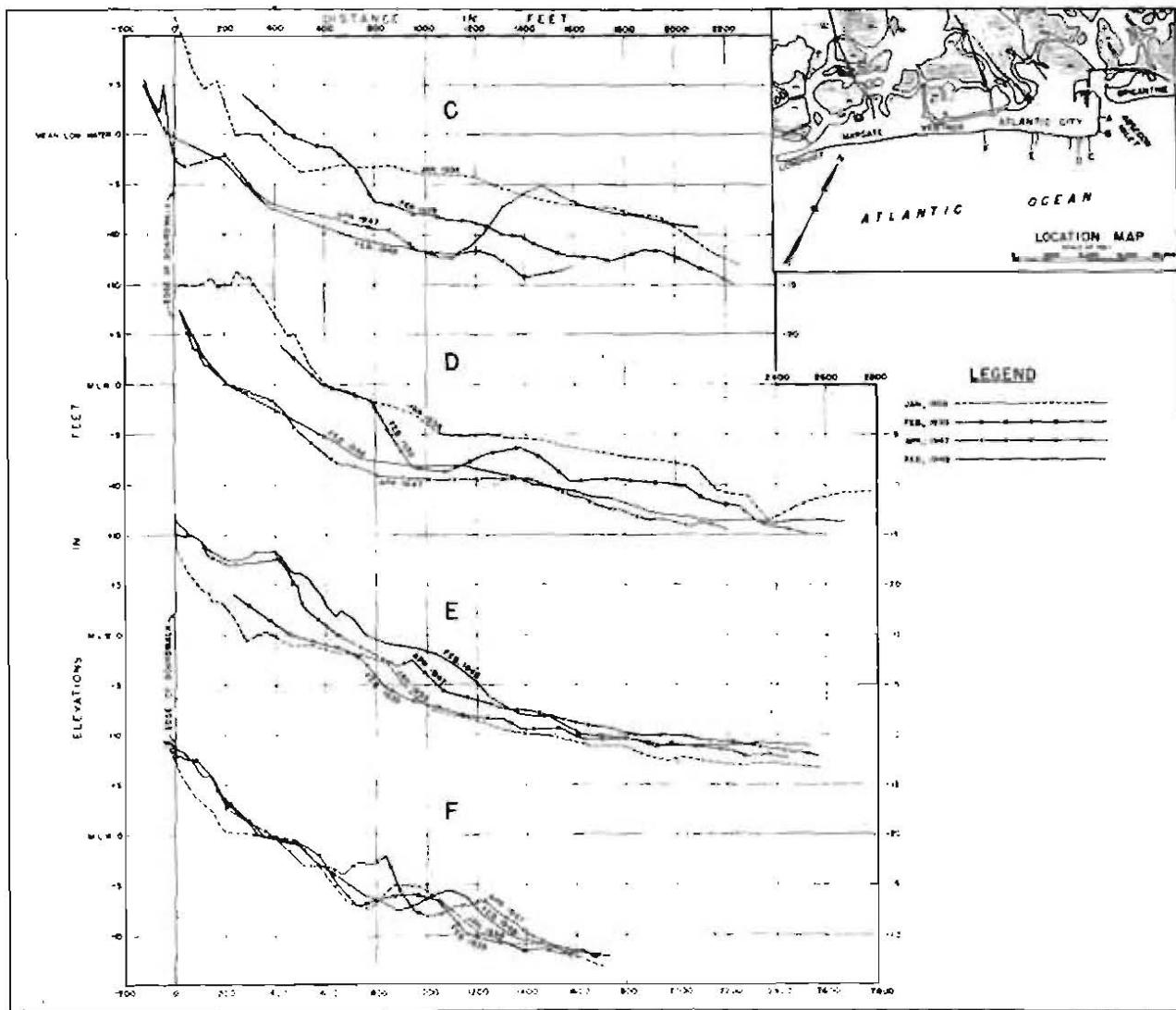


Figure 49. Profile changes along Atlantic City, 1936-48 (Beach Erosion Board, 1950).

2. Seasonal Changes and Wave Climate.

Figure 50 combines mean monthly wave height and period information obtained from Atlantic City and the Toms River Coast Guard Station (Fig. 1) for comparison. Of these sources, the gage data are considered more reliable although the visual observations provide important nearshore wave direction information. The gage data (Thompson and Harris, 1972) were obtained from 7-minute pen-and-ink records taken six times daily from a 7.62-meter relay-type gage located on the seaward end of Steel Pier. The visual observations (made by local volunteers) include estimations of nearshore wave period, height, direction, and breaker type. The Cooperative Surf Observation Program (COSOP) data were also obtained visually by cooperating personnel from U.S. Coast Guard Stations at Atlantic City and Toms River. As shown in Figure 50, there is considerable variation between these sources of wave data.

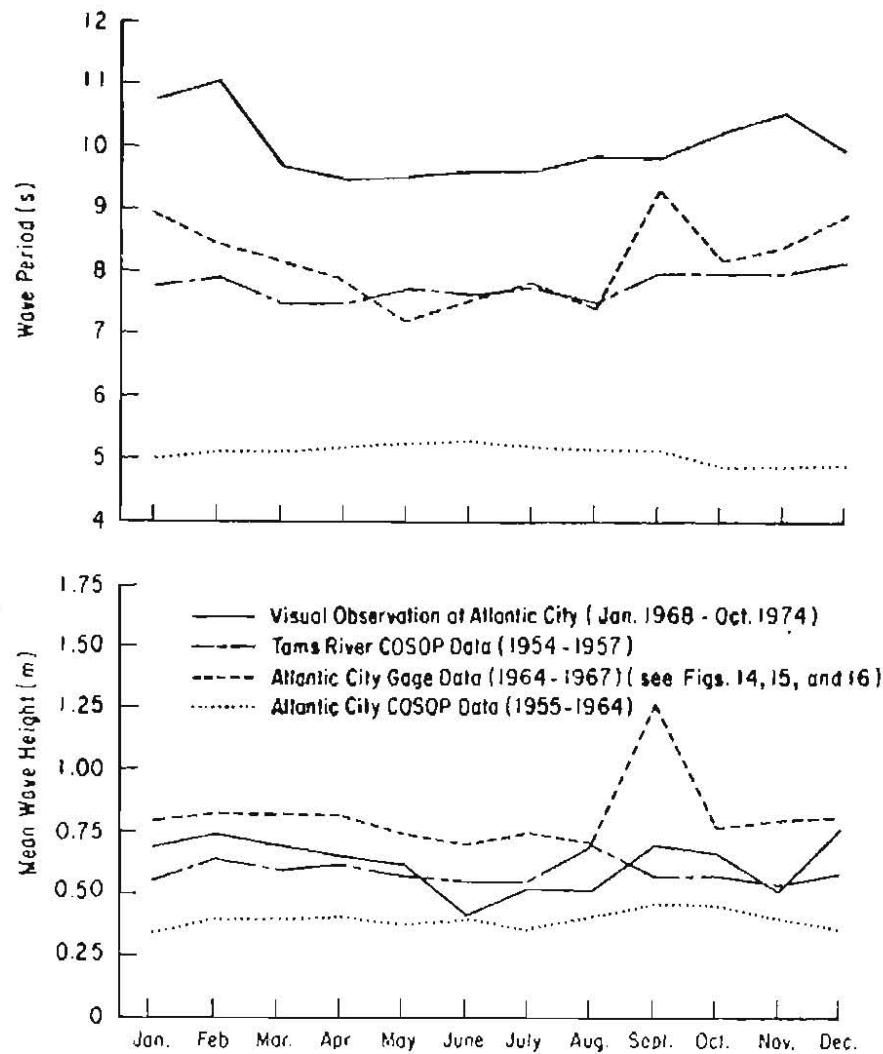


Figure 50. Mean monthly gage and visual data for wave heights and periods for Atlantic City.

The visual observation data indicate that the breaker approach is predominantly from within a sector of 5° to the left of shore-normal to an observer on the beach.

3. Coastal Engineering Implications.

The data in this study largely indicate the far-reaching influence of the two beach fills of 1963 and 1970. Judging from the volumetric and MSL shoreline changes through time, shown in Figures 33 and 44, respectively, the beach fills accomplished their purpose of rebuilding the beach, not only where the fill was directly placed, but also downdrift, as the result of natural littoral processes. The severe erosional condition at profile line 2, however, bears closer examination to determine the specific causes as well as possible solutions to this critical problem.

Among the greatest difficulties in determining how and where the sand is transported are the incomplete surveying of the entire Absecon Island and the

relatively shallow surveying out to only 2 feet below MSL. Therefore, the amount of sand transported offshore or alongshore to the southwest cannot be determined. To better understand the complex and dynamic sediment movement in this area, and thereby arrive at a functional solution, the entire island should be studied as a complete system from Absecon Inlet to Great Egg Harbor Inlet. This would enable a more reliable description of the processes involved along this coastline. More information should also be obtained relating to the processes of the inlets at both ends of the island to enhance the understanding of the impact these inlets have on Absecon Island.

Prestorm and poststorm surveys played an important role in understanding some of the storm-related processes taking place along this coast. Additional surveys of this type would significantly increase the awareness of just how much sand is moved and where during storms, which would then enable the area to plan accordingly before the storm season. Again, this points out the need to survey farther offshore to locate where some of the sand is being transported.

The implications of the beach-fill project in March 1979 indicate the need for careful planning of the time, location, and grain size of the fill material when undertaking such a project. The grain size of the fill material taken from under the Boardwalk for this project was much smaller than the median grain size of the beach material in the vicinity of the nourishment project. This factor, in conjunction with the time of year (March being a highly susceptible time for storm waves), resulted in most of the fill being washed away almost immediately on placement, according to a bulldozer operator on the site. This beach-fill project, then, appeared to be much less successful than the two fills conducted in 1963 and 1970.

VI. SUMMARY

Each of the seven profile lines at Atlantic City, spaced from a minimum of 467 meters to a maximum of 1.62 kilometers apart, was surveyed a minimum of 118 times, generally from the seaward edge of the Boardwalk to wading depth. Frequency of surveys ranged from weekly to quarterly (Figs. 20 and 21). During the study there were 17 reasonably well-documented storms with prestorm and poststorm surveys (Table 5).

The study area extends 5 kilometers southwest from the Absecon Inlet jetty and is comprised of 0.27-millimeter median grain-size quartz sand. The fore-shore slope ranges from 0.039 to 0.066 with an average of 0.047 over the seven profile lines. The berm width, measured from the Boardwalk, extends between 5 meters at profile line 2 and 180 meters at profile line 1 with an overall average of 80 meters. The average berm elevation above MSL is 2.2 meters with a range between 1.3 and 3.0 meters.

Winds are generally out of the southwest quadrant with mean speeds ranging from 20 to 45 kilometers per hour (Figs. 9, 10, and 11). The mean significant wave height is 0.81 meter with a mean wave period of 8.18 seconds consisting predominantly of plunging waves. The area also has a mean tidal range of 1.2 meters.

Among the largest natural changes measured between surveys at a single profile line were a volume loss of 51.39 cubic meters per meter during the

storm of 2 March 1969 at profile line 5 and a shoreline recession of 30.18 meters during the 25 February 1968 storm at profile line 7. Storm changes (Fig. 30) indicate no clear correlation between shoreline recession and erosion, as might be expected. For example, during the 2 March 1969 storm, the average shoreline accreted 6.99 meters, whereas the average above MSL unit volume eroded 11.01 cubic meters per meter. However, profile line 2 shows the most critical erosion, as shown in Figures 36, 37, and 38.

Major beach-fill projects were completed in 1963 and 1970, introducing approximately 428,000 and 635,000 cubic meters of fill material, respectively, to the northern end of the study area (see Fig. 31). These fills were reasonably successful in nourishing the beach, as shown in Figure 33.

Seasonal changes are indicated with a maximum volume of sand above MSL from May through October (Fig. 45). The net volume change above MSL along the beach, disregarding the 1970 beach fill, is near zero. Although the beach, as a whole, experienced a near zero net change during the period 1963-69, there was a shift of beach storage volume from the 1963 fill site on the northern end of the study area toward the southwest, along the beach (Fig. 33). This shift of beach volume was expected with time and resulted in an effective beach-fill project.

In conclusion, this study was extremely valuable for the quantitative determination of some of the shore processes taking place at Atlantic City as well as to indicate how such studies may be accomplished more effectively and efficiently in the future.

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APPENDIX A

PROFILE LINE DOCUMENTATION

The station description forms in this appendix provide a summary of all data needed to recover or reestablish a survey point.

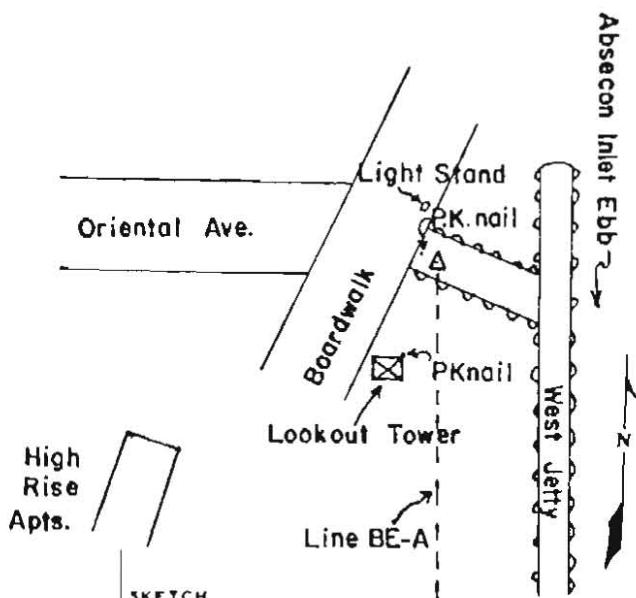
The horizontal and vertical control was first established when Atlantic City was surveyed for the Storm Warning Program, the forerunner of the Beach Evaluation Program. Most of the bronze disks were placed on the profile lines in 1975; a few were placed in 1976. All survey work was done by the U.S. Army Engineer District, Philadelphia. The given elevations are referenced to sea level datum.

The data on these forms are subject to change due to the reestablishment of survey points, or the updating of culture shown. CERC should be contacted for any updating of these data.

The station is located in Atlantic City, NJ at the east end of Oriental Avenue, and the north end of the west jetty of Absecon Inlet; 52.04 feet north of PK (elevation 7.58') nail in the lower end of diagonal brace under the NE corner of Coast Guard Lookout Tower; 11.69 feet east of NE corner of light stand on east side of boardwalk; 10.0 feet east of east side of boardwalk; 9.97 feet east of a PK nail in vertical side of the east stringer of boardwalk on centerline of Oriental Avenue extended; 3.0 feet north of centerline of stone groin, and 1.0 feet south of centerline Oriental Avenue extended.

The station is marked by a standard disk grouted into the top of stone grain.

NJ Grid Azimuth of Line BE-A $321^{\circ} - 30'$



DA FORM 1 OCT 54 1959

~~REPLACES DA FORMS 1850
AND 1860, 1 FEB 57, WHICH
ARE OBSOLETE.~~

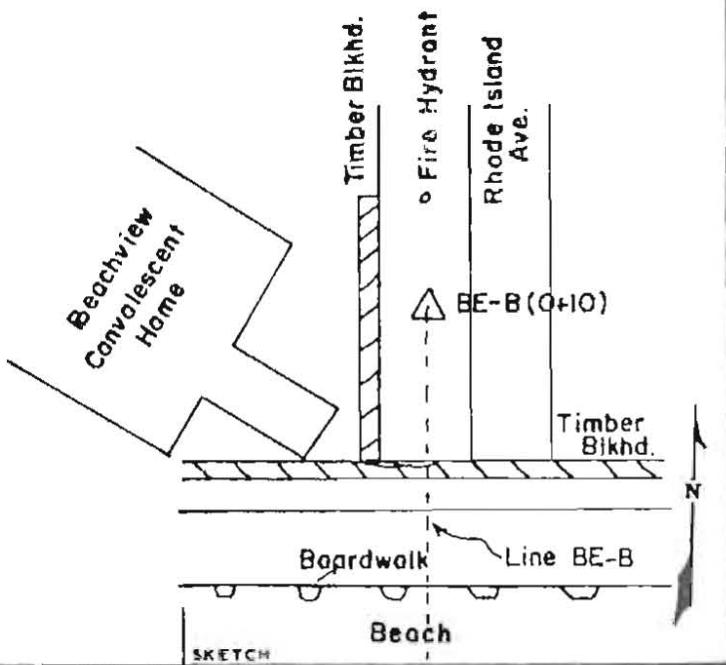
DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent
agency is U.S. Continental Army Command.

COUNTRY U. S. A.		TYPE OF MARK Standard Bronze Disk	STATION BE-B Sta. 0+10	Profile line 2	
LOCALITY Atlantic City, NJ		STAMPING ON MARK BE-B 0+10	AGENCY (CAST IN MARKS) Corps of Engrs.	ELEVATION (FT) 8.03 MAX	
LATITUDE 39° 21' 44.56"		LONGITUDE 74° 24' 46.26"	DATUM	DATUM S.L.D. 1929	
(NORTHING)(EASTING) (FT) 192 786		(EASTING)(NORTHING) (FT) 2 071 767	GRID AND ZONE NJ Trans Merc.	ESTABLISHED BY (AGENCY) Corps of Engineers	
(NORTHING)(EASTING) (FT) (M)		(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE 19 Nov 75	ORDER
TO OBTAIN GRID AZIMUTH, ADD			TO THE GEODETIC AZIMUTH		
TO OBTAIN GRID AZ. (AOD)(SUB.)			TO THE GEODETIC AZIMUTH		
OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS)	GRID DISTANCE (METERS) (FEET)	

The station is located in Atlantic City, NJ on the west sidewalk of Rhode Island Avenue; 130.40 feet north of a square cut in the top of concrete reinforcement on south side of boardwalk of Rhode Island Avenue (elevation 12.43'); 53.86 feet east of inner corner of Beachview convelescent home building; 48.5 feet north of a timber bulkhead at the ocean end of avenue; 39.97 feet NE of outer corner of Beachview convelescent home building; 10.00 feet south of top of fire hydrant and 1.5 feet west of the west curb of Rhode Island Avenue.

Station is marked by a standard disk grouted flush with sidewalk.

NJ Grid Azimuth of Line BE-B 332°-18'



DA FORM OCT 58 1959

REPLACES DA FORMS 1958
AND 1960, 1 FEB 67, WHICH
ARE OBSOLETE.

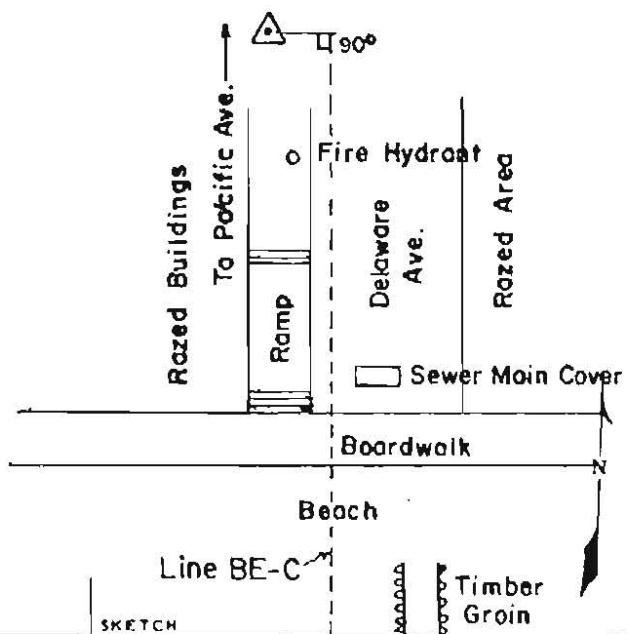
DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent
is responsible for its use.

COUNTRY U. S. A.	TYPE OF MARK Standard Bronze Disk	STATION BE-C Sta. (-)2+00 20' west	Profile line 3	
LOCALITY Atlantic City, NJ	STAMPING ON MARK BE-C -2+00 20'W	AGENCY (CAST IN MARKS) Corps of Engineers	ELEVATION 7.85	IFTI XXX
LATITUDE 39°21'36.91"	LONGITUDE 74°25'04.15"	DATUM	DATUM S.L.D. 1929	
(NORTHING)(EASTING) 192 008	(EASTING)(NORTHING) 2 070 364	(FT) (M)	GRID AND ZONE NJ Trans Merc.	ESTABLISHED BY (AGENCY) Corps of Engineers
(NORTHING)(EASTING) (FT)	(EASTING)(NORTHING) (M)	(FT) (M)	GRID AND ZONE	DATE 19 Nov 75 ORDER
TO OBTAIN GRID AZIMUTH, ADD GRID AZ. (ADD)(SUB.)		TO THE GEODETIC AZIMUTH		
TO OBTAIN GRID AZ. (ADD)(SUB.)		TO THE GEODETIC AZIMUTH		
OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)

The station is located in Atlantic City, NJ on the west side of Delaware Avenue in an area due for redevelopment; 45.23 feet north of south west corner of sewer main cover; 32.25 feet north of a fire hydrant; 4.92 feet west of a PK nail in the seam of west curb of Delaware Avenue.

Station is marked by a standard disk grouted flush into sidewalk, and is 20' west of profile line.

NJ Grid Azimuth of Line BE-C 333°-26'



DA FORM 1959 OCT 64

REPLACES DA FORMS 1050
AND 1060, 1 FEB 62, WHICH
ARE OBSOLETE.

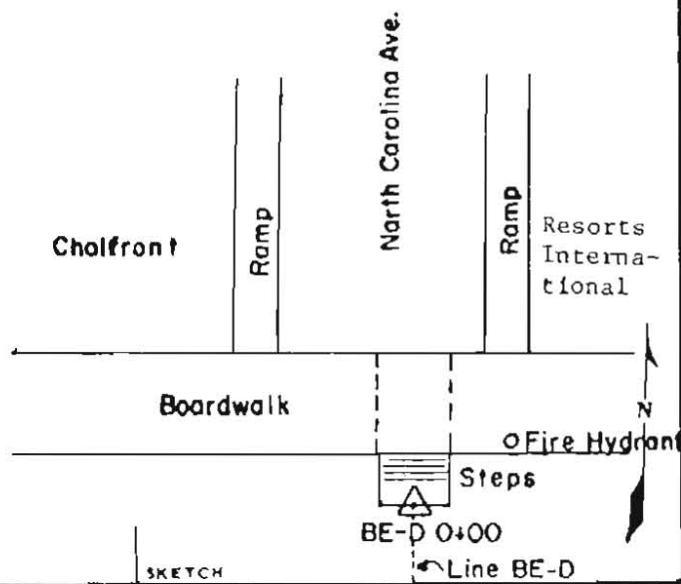
DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent
agency is U.S. Continental Army Command.

COUNTRY U. S. A.	TYPE OF MARK Standard Bronze Disk	STATION BE - D Sta. 0+00	Profile line 4	
LOCALITY Atlantic City, NJ	STAMPING ON MARK BE-D 0+00	AGENCY (CAST IN MARKS) Corps of Engrs.	ELEVATION 10.71	(FT) MMX
LATITUDE 39°21'27.78"	LONGITUDE 74°25'20.50"	DATUM	DATUM S.L.D. 1929	
(NORTHING)(EASTING) 191 081	(EASTING)(NORTHING) 2 069 082	(FT) MMX	GRID AND ZONE NJ Trans merc.	ESTABLISHED BY (AGENCY) Corps of Engineers
(NORTHING)(EASTING) (M)	(EASTING)(NORTHING) (M)	(FT) (M)	GRID AND ZONE	DATE 19 Nov 75 ORDER
TO OBTAIN GRID AZIMUTH, ADD °		TO THE GEODETIC AZIMUTH		
TO OBTAIN GRID AZ. (ADD)(SUB) °		TO THE GEODETIC AZIMUTH		
OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS)	GRID DISTANCE (METERS) (FEET)

Station is located in Atlantic City, NJ at the beach (south) end of North Carolina Avenue, under the boardwalk; 87.88 feet south east of the SE corner of Chalfont Building, 72.29 feet south west of SW corner of Resorts International; 29.52 feet southwest of the top center bolt of fire hydrant.

Station is marked by a standard disk grouted flush into the top step of a pedestrian ramp.

NJ Grid Azimuth of Line BE-D 332° -01'



DA FORM 1959 OCT 64

REPLACES DA FORMS 1959
AND 1960, 1 FEB 67, WHICH
ARE OBSOLETE.

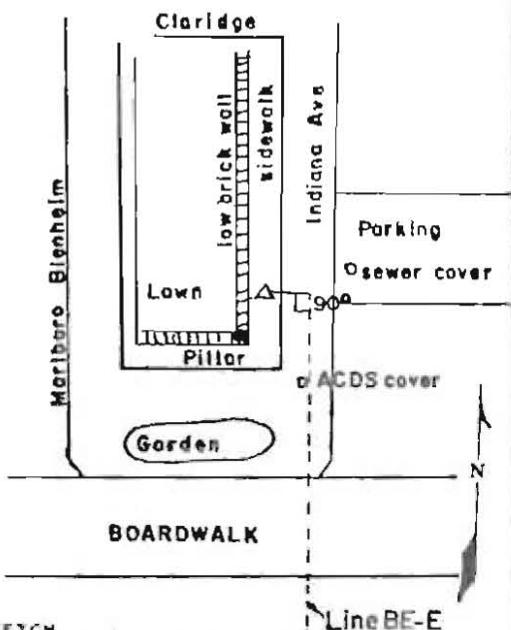
DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent
is Appendix I U.S. Continental Army Command.

COUNTRY U. S. A.	TYPE OF MARK Standard Bronze Disk		STATION BE-E (-)2+75 20' west Profile line 5	
LOCALITY Atlantic City, NJ	STAMPING ON MARK BE-E -2+75 20'W		AGENCY (CAST IN MARKS) Corps of Engrs.	ELEVATION (FT) 6.56 XBOX
LATITUDE 39° 21' 22.90"	LONGITUDE 74° 25' 52.27"		DATUM	DATUM S.L.D. 1929
(NORTHING)(EASTING) (FT) 190 580 XMX	(EASTING)(NORTHING) 2 066 588 XMX	(FT)	GRID AND ZONE NJ Trans Merc	ESTABLISHED BY (AGENCY) Corps of Engineers
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (M)	(FT)	GRID AND ZONE	DATE ORDER 24 Aug 76
TO OBTAIN GRID AZIMUTH, ADD °			TO THE GEODETIC AZIMUTH	
TO OBTAIN GRID AZ. (ADD)(SUB.) °			TO THE GEODETIC AZIMUTH	
OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)

Station is located in Atlantic City, NJ on the west side of Indiana Avenue, south of the Claridge Hotel, 49.60 feet west of the SE corner of sewer cover on the east side of Indiana Avenue; 18.79 feet north west of the NW corner of A.C.D.S. cover, just west of the centerline of street, and 12.85 feet north east of top center of pillar on NE side of steps leading to lawn.

Station is marked by a standard disk grouted flush into sidewalk, and is 20' west of profile line.

NJ Grid Azimuth of Line BE-E 332°-36'



DA FORM 1959 OCT 64

REPLACES DA FORMS 1959
AND 1960, 1 FEB 57, WHICH
ARE OBSOLETE.

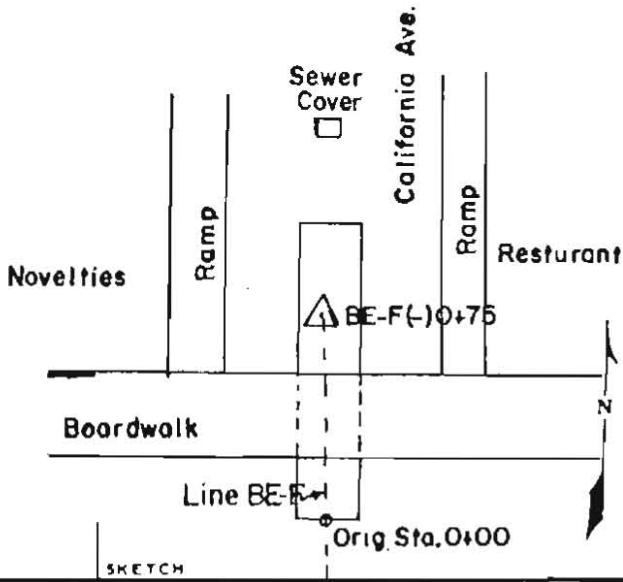
DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent
agency is U.S. Continental Army Command.

COUNTRY U. S. A.	TYPE OF MARK Standard Bronze Disk	STATION BE-F Sta. (-) 0+75 Profile line 6	
LOCALITY Atlantic City, NJ	STAMPING ON MARK BE-F -0+75	AGENCY (CAST IN MARKS) Corps of Engrs.	ELEVATION 5.20 (FT) MM
LATITUDE 39°21'08.93"	LONGITUDE 74°26'34.43"	DATUM	DATUM S.L.D. 1929
(NORTHING)(EASTING) 189 159	(EASTING)(NORTHING) 2 063 280	(FT) MM	GRID AND ZONE NJ Trans Merc.
(NORTHING)(EASTING)	(EASTING)(NORTHING)	(FT) (M)	ESTABLISHED BY (AGENCY) Corps of Engineers
			DATE 19 Nov 75 ORDER
TO OBTAIN	GRID AZIMUTH, ADD		
TO OBTAIN	GRID AZ. (ADD)(SUB.)		
OBJECT	AZIMUTH OR DIRECTION (GEOGRAPHIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)
	° ' "	° ' "	GRD DISTANCE (METERS) (FEET)

Station is located in Atlantic City, NJ under the boardwalk at the ocean, or south end of California Avenue, 49.38 feet south of the SE corner of sewer cover, just west of centerline of California Avenue, 12.0 feet SW of NE corner of east wall for ramp, 8.08 SE of the NW corner of west wall and 1.3 feet east of W. wall.

Station is marked by a standard disk grouted flush with surface of a pedestrian ramp.

NJ Grid Azimuth of Line BE-F $332^{\circ} - 55'$



DA FORM 1 OCT 54 1959

REPLACES DA FORMS 1959
AND 1960, 1 FEB 57, WHICH
ARE OBSOLETE.

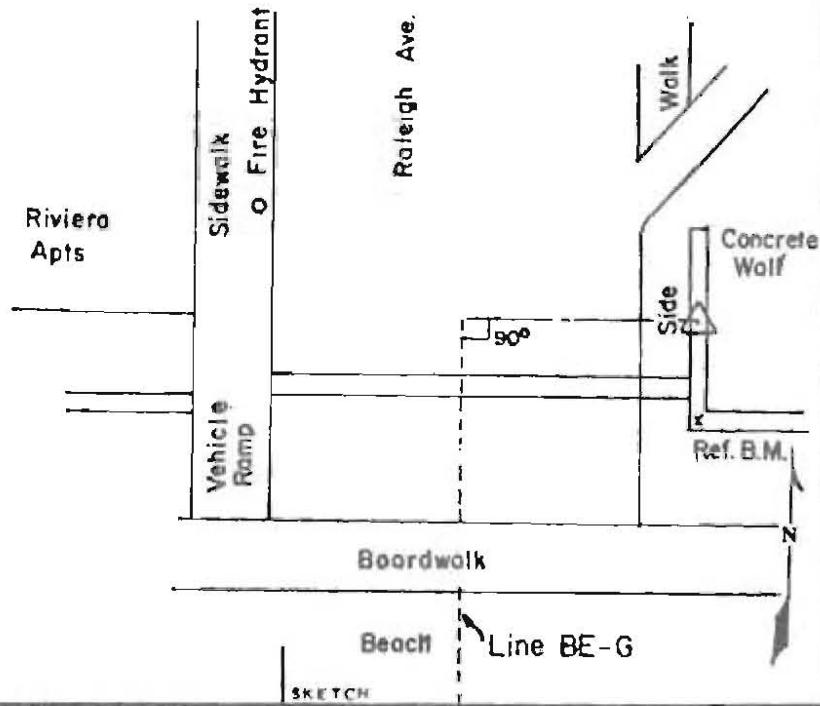
DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

For use of this form, see TM 5-237; the proponent agency is U.S. Continental Army Command.

The station is located in Atlantic City, NJ on the east side of south (ocean) end of Raleigh Avenue; 52.59' south of north end of concrete wall; 44.31 feet southeast of fire hydrant; 38.20 feet north of reference B.M. which is a square cut in the southwest corner of concrete wall (elevation 11.52); and 11.0 feet east of east curb of Raleigh Avenue.

Station is marked by a standard disk grouted flush in concrete wall on east side of Raleigh Avenue, and is 25.5' east of profile line.

NJ Grid Azimuth of Line BE-G $328^{\circ}14'$



DA FORM 1 OCT 4 1959

REPLACES DA FORMS 1888
AND 1889, 1 FEB 87, WHICH
ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION

For exec of this form, see TM 3-237; the propponent agency is U.S. Continental Army Command.

APPENDIX B

PROFILE LINE SURVEY DATA

The survey data for the Atlantic City beach study are tabulated by profile line number and survey date (in the form YRMODA). Distances are in feet from the profile line bench mark; elevations are in feet above MSL.

DATE 021024	DATE 021101	DATE 021106	DATE 021212	DATE 030109	DATE 030116	DATE 030122	DATE 030130								
BRVV															
TIME 1800	TIME 1800	TIME 1200	TIME 1800	TIME 1800	TIME 1200	TIME 1200	TIME 1200								
----	----	----	----	----	----	----	----								
00.	4.8	3.6	3.6	4.2	4.0	0.	7.1	17.	4.5	275.	4.2	0.	7.1		
121.	4.0	3.7	3.7	120.	4.0	105.	3.8	15.	7.0	30.	3.9	300.	4.4	18.	7.1
221.	3.9	3.9	3.8	220.	3.9	170.	4.0	17.	4.5	100.	3.4	350.	4.6	18.	4.5
321.	3.7	120.	3.6	273.	3.6	261.	4.2	50.	4.0	125.	3.3	400.	4.4	30.	3.9
420.	3.7	170.	3.0	371.	3.7	342.	4.4	100.	3.2	191.	3.4	451.	4.5	101.	3.5
508.	3.7	221.	3.9	470.	3.7	418.	4.6	150.	3.2	200.	3.5	500.	3.4	151.	3.5
542.	6.6	271.	3.7	571.	3.6	447.	4.3	200.	3.0	250.	3.7	531.	3.6	260.	3.8
660.	1.0	321.	3.6	570.	3.9	574.	4.8	250.	3.4	300.	3.8	551.	4.0	250.	3.7
723.	+0.5	370.	3.6	674.	1.2	973.	+2.0	300.	3.4	350.	3.9	601.	1.5	300.	3.8
		921.	3.8	683.	+5	988.	+3.3	350.	4.5	401.	4.1	674.	+1.8	350.	3.4
		420.	3.0	730.	+6			401.	3.4	425.	4.2			400.	4.0
		539.	0.3			450.	4.4	430.	3.9			451.	4.4		
		410.	1.8			500.	3.4	500.	3.3			500.	3.3		
		648.	+1.1			520.	3.4	519.	3.5			510.	3.3		
		697.	+1.4			551.	3.1	551.	2.8			531.	4.8		
		723.	+0.1			582.	1.7	601.	1.2			551.	3.2		
						600.	1.2	652.	-1.3			601.	1.0		
						625.	-5	674.	-1.0			651.	+0.5		
						650.	-1	701.	+1.4			676.	+1.0		
						676.	+1.3					701.	+1.1		

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DATE 030203	DATE 030213	DATE 030221	DATE 030227	DATE 030307	DATE 030313	DATE 030321	DATE 030402								
BRVV															
TIME 1800	TIME 1800	TIME 1200	TIME 1800	TIME 1800	TIME 1800	TIME 1200	TIME 1200								
----	----	----	----	----	----	----	----								
17.	4.8	3.8	+1.	7.1	50.	6.6	150.	8.8							
50.	3.8	100.	3.3	15.	7.1	94.	9.7	375.	5.0	14.	7.0	89.	6.5	200.	9.1
100.	3.4	131.	3.2	16.	0.1	125.	A.4	401.	5.8	16.	0.1	99.	7.3	225.	8.6
150.	3.5	200.	3.3	90.	0.6	150.	A.8	474.	3.3	29.	0.5	150.	8.5	250.	A.4
201.	3.8	250.	3.3	64.	7.9	200.	A.7	490.	5.0	45.	6.5	175.	8.4	875.	6.9
251.	3.7	301.	3.7	150.	8.7	225.	A.7	525.	3.0	99.	7.7	200.	9.0	300.	7.4
301.	3.7	350.	3.9	100.	0.0	275.	7.0	550.	4.4	150.	8.8	225.	8.4	325.	6.9
341.	4.8	401.	3.9	230.	8.3	300.	7.1	575.	3.3	175.	8.8	250.	8.3	350.	6.8
400.	4.2	451.	4.3	673.	7.4	351.	6.6	600.	2.5	200.	9.0	300.	6.6	800.	5.8
451.	4.4	501.	5.1	300.	6.9	400.	5.7	627.	1.7	225.	8.4	324.	6.7	425.	5.7
500.	5.3	525.	5.3	350.	6.4	450.	5.0	650.	1.2	250.	8.4	350.	6.3	450.	5.0
529.	5.3	551.	4.9	400.	5.6	500.	5.1	701.	0.0	275.	7.7	300.	5.8	475.	5.2
551.	4.1	601.	4.9	425.	5.3	425.	5.0	726.	+0.0	300.	7.0	425.	5.2	525.	5.2
573.	2.0	631.	0.9	450.	5.0	550.	4.0	751.	+1.1	325.	6.8	450.	4.9	551.	4.4
601.	1.1	677.	+1.2	474.	8.9	576.	1.4			351.	6.3	500.	5.0	576.	3.2
651.	0.0			300.	5.3	600.	1.0			400.	5.8	550.	4.8	601.	2.2
676.	+1.0			529.	5.6	650.	1.1			424.	5.2	574.	4.2	651.	.5
				600.	1.0	676.	.5			451.	4.9	600.	3.0	675.	0.0
				651.	.7	700.	0.0			474.	4.9	651.	1.2	700.	+1.4
				700.	.7	726.	+1.0			500.	5.0	701.	0.8		
				726.	+1.0					526.	5.0	725.	4.0		
										550.	4.7	751.	+0.0		
										575.	3.8				
										600.	2.7				
										625.	1.9				
										651.	1.2				
										700.	0.6				
										725.	0.0				
										750.	-1.3				

DATE	030523	DATE	030611	DATE	030626	DATE	030712	DATE	030724	DATE	030807	DATE	030823	DATE	030905
HRVY	17	HRVY	18	HRVY	19	HRVY	20	HRVY	21	HRVY	22	HRVY	23	HRVY	24
TIME	1200	TIME	1800	TIME	1800	TIME	1200	TIME	1800	TIME	1800	TIME	1800	TIME	1200
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
100.	6.8	0.8	7.1	200.	0.2	0.1	7.1	50.	0.6	0.	7.1	0.	7.1	300.	6.7
200.	8.8	1.8	7.1	200.	0.1	14.	7.0	100.	7.8	18.	7.1	50.	8.3	200.	6.2
300.	7.0	3.0	6.9	300.	7.0	15.	6.5	150.	6.1	15.	6.6	90.	7.0	300.	5.3
400.	9.3	5.0	7.1	400.	6.5	40.	6.6	200.	6.2	50.	6.4	150.	6.1	300.	5.6
500.	9.3	10.0	7.0	500.	5.0	100.	8.1	224.	8.8	99.	9.1	200.	8.0	300.	9.8
750.	8.4	15.0	9.1	750.	3.1	150.	9.0	250.	8.6	150.	8.8	250.	8.3	600.	8.3
300.	7.3	20.0	9.2	300.	5.4	200.	9.0	300.	7.3	200.	8.0	300.	7.3	600.	9.0
350.	6.9	250.	8.8	350.	9.1	250.	8.5	350.	6.5	250.	8.8	350.	8.7	700.	2.0
400.	6.3	300.	7.0	400.	5.2	300.	7.3	400.	6.3	300.	7.0	400.	6.1	700.	1.0
450.	5.4	350.	6.4	450.	4.7	350.	6.7	450.	5.0	350.	6.7	450.	5.2	500.	5.2
500.	5.3	400.	6.2	500.	2.6	400.	5.6	500.	5.2	400.	6.0	500.	5.2	550.	5.2
550.	5.3	450.	5.5	550.	1.8	450.	5.3	550.	5.3	450.	5.8	550.	5.2	600.	5.2
600.	4.6	500.	5.2	600.	0.0	500.	5.3	600.	5.2	500.	5.2	500.	5.1	650.	5.1
620.	6.1	550.	5.2	620.	0.0	550.	5.3	620.	5.4	550.	5.3	600.	5.3	650.	5.3
650.	3.3	590.	5.2	650.	-0.1	600.	4.9	700.	2.2	600.	5.2	620.	4.6	700.	4.6
700.	1.3	600.	5.7	700.	0.0	625.	4.5	725.	1.0	625.	5.1	650.	4.8	750.	3.9
750.	1.2	650.	3.0	750.	0.0	650.	2.0	750.	1.0	670.	2.0	670.	3.0	700.	3.9
800.	-1.0	700.	1.4	800.	0.0	670.	1.0	770.	0.7	700.	1.0	700.	1.0	750.	1.0
820.	0.8	720.	1.8	820.	0.0	700.	1.0	850.	0.7	750.	1.0	720.	1.0	770.	0.2
770.	0.0			770.	0.0			800.	0.2	750.	0.0	770.	0.0	800.	0.7
820.	1.0			820.	0.0			850.	0.4	770.	0.0	820.	0.0	850.	0.2

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DATE 630929	DATE 631009	DATE 631028	DATE 631118	DATE 631231	DATE 640117	DATE 640214	DATE 640312
BRVY 25	BRVY 25	BRVY 27	BRVY 28	BRVY 29	BRVY 30	BRVY 31	BRVY 32
TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200
-----	-----	-----	-----	-----	-----	-----	-----
0.	7.2	-6.0	10.5	20.1	9.0	-6.1	10.5
14.	7.1	-2.5	7.5	20.1	8.2	-2.5	7.5
15.	6.4	-1.	7.0	20.1	6.7	0.	6.9
25.	5.7	14.	7.0	19.2	5.8	15.	6.0
30.	7.0	15.	6.1	20.3	5.2	15.	6.0
101.	8.8	25.	9.9	20.0	8.8	25.	8.5
152.	9.3	50.	6.0	50.0	8.3	51.	6.8
202.	8.8	100.	8.0	52.0	4.5	101.	4.1
242.	8.8	151.	8.9	54.0	4.0	151.	4.1
302.	5.7	201.	9.0	60.0	9.3	202.	8.0
352.	5.0	75.2	7.0	64.5	2.8	252.	3.6
442.	4.4	50.3	5.0	75.0	1.6	302.	3.3
500.	4.0	55.3	5.6	75.6	0.0	353.	5.8
532.	3.8	60.3	6.0	77.9	-2.	403.	6.8
580.	3.8	65.0	6.7	80.6	-0.8	453.	7.6
600.	3.8	90.0	3.9	90.4	1.0	503.	4.2
631.	3.8	93.0	3.7	95.0	1.2	553.	4.0
681.	1.0	55.4	3.7	65.9	0.13	580.	3.0
787.	.6	80.4	4.5	85.0	1.2	554.	4.0
731.	8.0	83.0	2.3	85.5	1.0	630.	2.7
		85.6	1.8			655.	1.0
		70.0	0.0			700.	1.0
		73.1	-1.4			731.	-1.7
		75.6	-1.1			756.	-1.1
		80.6	-1.6			806.	-1.6
		83.1	-2.1			831.	-2.1

DATE 680409	DATE 680927	DATE 680928	DATE 680931	DATE 680925	DATE 681203	DATE 690120	DATE 690428
BRVV 33	BRVV 34	BRVV 35	BRVV 36	BRVV 37	BRVV 38	BRVV 39	BRVV 40
TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200
-----	-----	-----	-----	-----	-----	-----	-----
.23.	5.1	25.	4.7	0.4	6.8	0.	6.8
50.	5.3	50.	4.9	23.	5.1	49.	5.2
100.	4.5	100.	5.5	50.	5.2	50.	5.2
150.	3.4	151.	3.9	100.	4.2	100.	4.0
201.	2.0	201.	3.2	151.	3.7	201.	3.5
251.	3.1	251.	2.8	201.	3.1	251.	3.1
301.	3.1	302.	2.7	251.	3.1	301.	3.5
351.	2.9	351.	2.9	301.	2.9	351.	3.4
402.	2.6	402.	2.9	351.	2.9	402.	2.3
452.	2.7	452.	2.8	402.	2.6	452.	4.4
503.	2.0	503.	2.0	452.	2.7	503.	0.6
553.	2.8	553.	1.8	503.	2.6	553.	3.9
604.	2.1	604.	2.0	553.	2.7	603.	1.0
654.	.8	654.	3.7	603.	3.3	653.	1.8
705.	.3	704.	.1	653.	3.2	705.	.1
755.	.2	755.	.2	704.	1.8	755.	.1
805.	.3	780.	.3	705.	.2	805.	.3
		780.	.1	804.	.0	805.	.1
		805.	.0	830.	.1	861.	.2
		855.	.1	855.	.1		

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DATE 690908	DATE 691208	DATE 691220	DATE 690126	DATE 690309	DATE 690426	DATE 691103	DATE 690118
BRVV 61	BRVV 62	BRVV 63	BRVV 64	BRVV 65	BRVV 66	BRVV 67	BRVV 68
TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200
-----	-----	-----	-----	-----	-----	-----	-----
.25.	4.9	6.	6.9	25.	5.8	25.	5.2
50.	5.5	50.	4.7	51.	6.0	50.	6.8
100.	3.4	101.	3.2	100.	3.3	100.	3.4
151.	3.5	151.	3.0	151.	2.7	151.	3.8
201.	3.2	202.	2.8	201.	2.7	201.	3.4
252.	2.4	252.	2.0	252.	2.0	252.	1.5
302.	2.7	302.	2.8	302.	3.2	302.	3.4
353.	2.6	352.	3.1	352.	2.9	352.	3.8
403.	2.4	403.	3.8	402.	3.2	402.	3.7
453.	2.7	453.	3.6	452.	3.5	452.	3.2
503.	2.0	503.	3.0	503.	3.7	503.	3.1
553.	3.3	554.	4.1	553.	3.7	553.	3.6
604.	4.3	604.	3.7	604.	4.4	603.	4.4
654.	4.8	654.	1.9	654.	4.2	654.	2.0
705.	1.8	704.	2.8	704.	.5	704.	.3
755.	.1	755.	.0	705.	.7	754.	.1
805.	.8	805.	.1	805.	.9	805.	.2
		805.	.8	855.	.3	855.	.0
		855.	.2				

DATE 670523	DATE 670619	DATE 670719	DATE 671213	DATE 680115	DATE 680124	DATE 680130	DATE 680208
BRVT 89	BRVT 50	BRVT 51	BRVT 82	BRVT 53	BRVT 54	BRVT 55	BRVT 56
TIME 1800	TIME 1800	TIME 1200					
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23.	8.0	23.	4.2	26.	8.0	24.	4.4
50.	4.0	50.	3.8	50.	4.1	50.	4.2
101.	3.3	100.	3.7	100.	2.7	100.	2.6
151.	3.0	150.	2.8	150.	2.7	150.	2.4
201.	3.0	200.	2.8	200.	2.6	200.	2.5
252.	2.9	250.	2.7	250.	2.6	250.	2.3
304.	2.6	300.	2.7	300.	2.6	300.	2.4
353.	2.5	350.	2.4	350.	2.5	350.	2.4
402.	2.0	400.	2.3	400.	2.0	400.	1.9
453.	1.8	450.	2.2	450.	1.9	450.	1.8
503.	1.9	500.	1.9	500.	1.7	500.	1.5
553.	1.9	550.	1.9	550.	1.1	550.	1.3
603.	2.4	600.	2.8	600.	1.4	600.	1.3
654.	2.3	650.	3.8	650.	1.1	650.	2.3
704.	1.2	700.	3.8	700.	1.5	700.	1.0
755.	1.4	750.	1.9	750.	1.4	750.	1.7
804.	1.2	800.	1.1	800.	1.5	800.	1.5
854.	1.4	850.	1.0	850.	1.5	850.	0.6
900.	1.8	900.	2.1	900.	2.1	900.	0.6

DATE 680218	DATE 680221	DATE 680226	DATE 680307	DATE 680313	DATE 680322	DATE 681007	DATE 681025
BRVT 57	BRVT 58	BRVT 49	BRVT 60	BRVT 61	BRVT 62	BRVT 63	BRVT 64
TIME 1800	TIME 1800	TIME 1200					
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-1.	7.1	-1.	7.1	0.	7.1	0.	8.0
23.	3.8	28.	3.9	24.	3.9	24.	3.8
55.	3.8	50.	3.8	50.	3.9	50.	3.9
100.	2.4	100.	2.4	100.	2.5	100.	2.6
150.	2.4	150.	2.6	150.	2.5	150.	2.4
200.	2.4	199.	2.6	200.	2.5	200.	2.5
250.	2.3	251.	2.4	251.	2.4	251.	2.5
300.	2.3	300.	2.5	300.	2.7	300.	2.7
350.	2.3	350.	2.4	350.	2.9	350.	2.7
400.	3.0	400.	2.8	400.	2.9	400.	2.8
450.	2.8	450.	2.8	450.	2.9	450.	2.8
500.	2.6	500.	2.6	500.	2.7	500.	2.6
550.	2.3	550.	2.6	550.	3.2	550.	3.0
600.	2.3	600.	2.7	600.	2.8	600.	2.7
651.	1.8	650.	2.3	650.	2.1	650.	2.0
700.	1.7	699.	1.7	700.	1.0	700.	1.0
750.	0.9	750.	1.2	750.	1.1	750.	1.4
800.	1.1	799.	1.0	800.	1.4	800.	0.9
850.	1.2	828.	1.3	800.	1.3	850.	1.1
900.	1.4	900.	1.4	890.	2.0	879.	2.0

DATE 681115	DATE 681220	DATE 690113	DATE 690122	DATE 690129	DATE 690205	DATE 690212	DATE 690219
BRVV 85	BRVV 66	BRVV 67	BRVT 68	BRVV 70	BRVT 71	BRVV 72	BRVV 73
TIME 1200							
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25. 8.1	25. 8.4	0. 7.2	0. 7.2	0. 7.2	0. 7.2	25. 8.9	0. 7.2
50. 4.8	50. 4.6	75. 4.4	25. 3.9	25. 4.3	25. 4.1	50. 3.6	25. 3.7
100. 3.3	100. 3.0	50. 2.6	50. 2.0	50. 2.1	50. 2.0	100. 2.9	50. 3.8
150. 3.1	150. 2.8	100. 2.0	100. 1.9	100. 2.0	100. 2.0	150. 2.7	100. 3.0
200. 3.0	200. 2.7	150. 2.0	150. 1.9	150. 2.0	150. 2.0	200. 2.7	150. 2.7
250. 3.1	250. 2.8	200. 2.0	200. 1.9	200. 2.0	200. 2.0	250. 2.8	200. 2.8
300. 3.0	300. 2.8	250. 2.0	250. 1.9	250. 2.0	250. 2.0	300. 2.9	250. 2.9
350. 3.1	350. 3.1	300. 2.0	300. 1.9	300. 2.0	300. 2.0	350. 2.2	300. 3.0
400. 3.2	400. 3.3	350. 2.0	350. 1.9	350. 2.0	350. 2.0	400. 3.6	350. 3.5
450. 3.0	450. 3.7	400. 2.0	400. 1.9	400. 2.0	400. 2.0	450. 3.9	400. 3.5
500. 3.1	500. 3.6	450. 2.0	450. 1.9	450. 2.0	450. 2.0	500. 4.0	450. 3.7
550. 3.2	550. 3.7	500. 2.0	500. 1.9	500. 2.0	500. 2.0	550. 3.8	500. 3.9
600. 3.0	600. 3.7	550. 2.0	550. 1.9	550. 2.0	550. 2.0	600. 3.7	550. 3.7
650. 2.8	650. 2.6	600. 2.0	600. 1.9	600. 2.0	600. 2.0	650. 3.0	600. 3.3
700. 2.8	700. 1.7	650. 2.0	650. 1.9	650. 2.0	650. 2.0	700. 2.1	675. 1.7
750. 2.4	750. 0.0	700. 2.0	700. 1.9	700. 2.0	700. 2.0	750. 0.1	700. 1.9
800. 2.1	800. 21.2	750. 0.0	750. 1.9	750. 1.0	750. 0.8	800. 2.0	750. 0.6
850. 21.6	850. 23.0	750. 01.6	750. 01.7	750. 0.8	750. 0.6	850. 22.2	850. 21.3
900. 23.8	850. 23.0	800. 02.3	800. 02.3	800. 02.3	800. 02.3	850. 23.0	850. 22.0

0/

DATE 690226	DATE 690305	DATE 690312	DATE 690319	DATE 690527	DATE 690923	DATE 691023	DATE 691120
BRVV 73	BRVV 76	BRVV 75	BRVT 76	BRVV 77	BRVV 78	BRVV 79	BRVV 80
TIME 1200							
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0. 7.2	0. 7.2	0. 7.2	0. 7.2	50. 1.0	0. 7.2	0. 7.2	0. 7.2
25. 3.6	25. 3.3	25. 3.3	25. 3.3	50. 3.1	100. 2.5	25. 6.4	25. 6.2
50. 3.6	50. 3.6	50. 3.5	50. 3.3	100. 2.5	150. 2.5	50. 3.9	50. 3.6
100. 2.0	100. 2.8	100. 2.8	100. 2.5	150. 2.5	200. 2.7	100. 2.8	100. 2.7
150. 2.0	150. 2.8	150. 2.8	150. 2.7	200. 2.5	250. 2.5	150. 2.9	150. 2.9
200. 2.0	200. 3.0	200. 3.1	200. 2.9	250. 2.5	300. 2.7	200. 3.1	200. 2.9
250. 3.1	250. 3.1	250. 3.2	250. 2.9	300. 2.8	350. 2.6	250. 3.2	250. 3.0
300. 3.4	300. 3.2	300. 3.2	300. 3.1	350. 2.2	400. 2.6	300. 3.2	300. 3.1
350. 3.6	350. 3.1	350. 3.2	350. 3.1	400. 1.8	450. 2.3	350. 3.2	350. 3.0
400. 3.8	400. 3.0	400. 3.0	400. 2.9	450. 2.6	500. 3.2	400. 3.4	400. 3.0
450. 3.5	450. 2.8	450. 2.8	450. 2.7	500. 3.0	550. 3.6	450. 2.9	450. 3.2
500. 3.6	500. 2.7	500. 2.8	500. 2.8	550. 3.5	600. 5.0	500. 3.2	500. 3.1
550. 3.7	550. 1.9	550. 2.1	550. 2.3	600. 4.2	650. 6.3	550. 6.4	550. 3.5
600. 3.1	600. 1.4	600. 1.4	600. 2.0	650. 5.6	700. 8.5	600. 6.4	600. 3.8
650. 2.0	650. 1.4	650. 2.4	650. 3.3	700. 7.9	750. 1.2	650. 6.6	650. 2.8
700. 2.0	700. 1.7	700. 2.2	700. 2.1	750. 1.3	800. 1.4	650. 1.2	700. 1.1
750. 2.1	750. 1.8	750. 0.0	750. 0.2	800. 2.0	850. 1.4	700. 1.3	750. 0.5
800. 2.1	800. 1.1	800. 01.8	800. 01.9	850. 3.0	900. 2.1	800. 01.9	800. 01.9
850. 21.5	850. 01.5	850. 03.0	850. 03.2	850. 3.0	900. 03.0	850. 03.0	850. 03.0
900. 22.5	850. 01.5	850. 03.0	850. 03.2	850. 3.0	900. 03.7	850. 03.0	850. 02.9

DATE 691216	DATE 700114	DATE 700121	DATE 700128	DATE 700204	DATE 700211	DATE 700218	DATE 700225
BRVY A1	BRVY 82	BRVY 83	BRVY 80	BRVY 85	BRVY 86	BRVY 87	BRVY 88
TIME 1200	TIME 1200	TIME 1800	TIME 1200				
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0.	7.8	0.	7.2	0.	7.8	0.	7.2
25.	4.1	25.	4.1	25.	4.1	25.	4.1
50.	3.7	50.	3.9	50.	3.7	50.	3.7
100.	2.9	100.	3.1	100.	2.9	100.	2.9
150.	2.9	150.	3.0	150.	2.8	150.	2.8
200.	2.9	200.	3.2	200.	2.8	200.	2.8
240.	3.1	250.	3.2	250.	3.1	250.	3.2
300.	3.0	300.	3.2	300.	3.0	300.	3.0
340.	3.1	350.	3.1	350.	3.0	350.	3.0
400.	4.8	400.	5.3	400.	4.3	400.	4.5
450.	5.0	450.	5.4	450.	5.3	450.	5.1
500.	5.1	500.	5.2	500.	5.3	500.	5.2
540.	4.7	550.	5.2	550.	5.3	550.	4.8
600.	3.7	600.	2.9	600.	3.0	600.	3.3
650.	2.8	650.	2.6	650.	2.7	650.	2.5
700.	1.9	675.	2.4	700.	1.9	700.	1.2
750.	0.8	700.	1.6	700.	0.8	700.	0.6
800.	-2.0	750.	-1.1	750.	-0.9	750.	-1.9
850.	-2.4	761.	-2.6	800.	-2.1	850.	-2.1
900.	-3.7	800.	-1.0	900.	-0.8	900.	-1.0
	850.	-2.2					
	900.	-4.6					

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DATE 700304	DATE 700311	DATE 700318	DATE 700415	DATE 700426	DATE 701015	DATE 701106	DATE 701209
BRVY 89	BRVY 90	BRVY 91	BRVY 92	BRVY 93	BRVY 94	BRVY 95	BRVY 96
TIME 1200	TIME 1200	TIME 1800	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1800
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25.	4.3	25.	4.2	25.	4.3	0.	7.2
50.	3.6	50.	3.4	50.	3.7	25.	7.6
100.	2.8	100.	2.8	100.	2.8	50.	8.4
150.	2.8	150.	2.8	150.	2.8	50.	8.1
200.	2.8	200.	2.8	150.	2.8	100.	8.3
240.	2.9	250.	3.0	200.	2.7	150.	8.4
300.	3.1	300.	3.0	250.	3.0	200.	8.2
340.	4.0	350.	3.8	300.	3.5	250.	8.7
400.	5.0	400.	4.5	350.	4.1	300.	8.1
450.	5.0	450.	5.8	400.	5.8	400.	8.0
500.	5.4	500.	5.1	450.	5.0	350.	8.0
550.	5.0	550.	4.8	500.	4.8	450.	8.6
575.	5.4	600.	5.6	550.	4.9	500.	8.2
600.	4.0	650.	2.7	600.	4.0	550.	8.5
625.	4.4	700.	0.8	650.	4.7	600.	8.1
650.	4.7	750.	-1.6	700.	0.8	650.	8.9
675.	1.6	800.	-1.8	750.	0.1	700.	8.7
700.	-2.4	850.	0.6	800.	-2.1	800.	8.8
750.	-1.8	900.	0.0	850.	-0.3	850.	0.5
800.	-2.5			900.	-1.1	900.	-1.0
	950.	-1.9		950.	-2.4	950.	-2.0
	1000.	-3.0		1000.	-3.8	1000.	-3.8

DATE	T11213	DATE	T20110	DATE	T20218	DATE	T20226	DATE	T20317	DATE	T20410	DATE	T20581	DATE	T21028
BRVY	105	BRVY	106	BRVY	107	BRVY	108	BRVY	109	BRVY	110	BRVY	111	BRVY	112
TIME	1800														
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25.	4.7	25.	4.8	25.	4.9	25.	5.7	25.	6.0	25.	6.8	25.	6.6	25.	6.6
30.	5.1	30.	5.5	30.	5.8	30.	6.3	30.	6.4	30.	6.5	30.	6.5	30.	6.1
100.	4.8	100.	5.1	100.	5.2	100.	4.3	100.	5.0	100.	5.2	100.	5.8	100.	5.3
150.	4.1	150.	4.0	150.	4.0	150.	3.0	150.	3.9	150.	3.9	150.	3.8	150.	3.6
200.	4.9	200.	4.0	200.	4.1	200.	3.8	200.	3.5	200.	3.4	200.	3.8	200.	3.5
250.	3.9	250.	5.8	250.	4.1	250.	5.7	250.	5.5	250.	5.4	250.	5.0	250.	3.5
300.	3.8	300.	3.8	300.	4.0	300.	3.9	300.	3.7	300.	3.9	300.	3.8	300.	3.6
350.	3.7	350.	3.8	350.	4.1	350.	3.8	350.	3.7	350.	3.9	350.	3.7	350.	3.7
400.	3.5	400.	3.8	400.	4.8	400.	3.7	400.	3.8	400.	4.1	400.	3.7	400.	3.6
450.	3.7	450.	3.8	450.	5.1	450.	3.2	450.	3.9	450.	3.3	450.	3.8	450.	3.6
500.	3.5	500.	3.7	500.	5.2	500.	2.8	500.	3.6	500.	3.4	500.	3.5	500.	3.5
550.	3.2	550.	3.2	550.	6.8	550.	2.5	550.	3.7	550.	3.8	550.	3.8	550.	3.4
600.	4.3	600.	5.3	600.	6.0	600.	2.2	600.	3.1	600.	5.3	600.	5.2	600.	5.7
650.	4.3	650.	4.7	650.	5.1	650.	1.8	650.	2.3	650.	4.1	650.	5.0	650.	3.3
700.	3.7	700.	3.7	700.	6.0	700.	1.3	700.	1.9	700.	4.1	700.	4.6	700.	2.9
750.	2.6	750.	4.1	750.	6.6	750.	1.7	750.	1.2	750.	1.6	750.	1.2	750.	1.2
800.	3.7	800.	4.3	800.	6.5	800.	1.5	800.	2.7	800.	1.4	800.	4.3	800.	0.5
850.	2.8			850.	6.8			850.	2.8	850.	2.8	850.	2.8	850.	2.8

DATE	7212NB	DATE	730109	DATE	730816	DATE	730310	DATE	730324	DATE	730809	DATE	730810
BRVV	113	BRVV	114	BRVV	115	BRVV	116	BRVV	117	BRVV	118	BRVV	119
TIME	1200	TIME	1000	TIME	1000	TIME	0800	TIME	0800	TIME	1200	TIME	1100
75.	4.3	25.	3.9	75.	3.5	25.	3.7	25.	3.2	25.	3.2	25.	3.5
40.	3.1	30.	3.0	40.	3.3	30.	3.2	30.	3.1	30.	3.1	30.	3.2
100.	1.2	100.	1.1	100.	1.0	100.	2.8	100.	2.5	100.	2.5	100.	2.6
150.	3.2	150.	3.2	150.	3.0	150.	2.9	150.	2.6	150.	2.5	150.	2.6
200.	3.6	200.	3.2	200.	3.0	200.	3.0	200.	2.4	200.	2.5	200.	2.3
250.	3.4	250.	3.1	250.	3.0	250.	3.1	250.	2.3	250.	2.2	250.	2.2
300.	3.4	300.	3.3	300.	3.1	300.	3.2	300.	2.2	300.	2.3	300.	2.3
350.	3.3	350.	1.0	350.	3.1	350.	3.2	350.	2.2	350.	2.5	350.	2.2
400.	3.4	400.	3.6	400.	2.8	400.	3.2	400.	2.3	400.	2.6	400.	2.2
450.	3.9	450.	3.4	450.	2.8	450.	3.4	450.	2.1	450.	2.4	450.	2.2
500.	3.2	500.	1.4	500.	2.8	500.	3.7	500.	1.7	500.	2.3	500.	2.2
550.	3.8	550.	4.6	550.	2.6	550.	1.8	550.	1.3	550.	4.0	550.	2.4
600.	3.4	595.	4.7	600.	3.1	600.	3.3	600.	1.0	550.	4.3	600.	2.9
610.	3.8	600.	4.5	600.	1.7	600.	1.8	600.	1.2	600.	3.5	650.	2.5
650.	1.3	650.	2.3	700.	.8	700.	.1	700.	1.1	650.	2.1	700.	1.8
690.	-1.6	700.	-1.3	750.	-1.3	750.	-1.3	750.	-1.0	700.	-1.3	750.	-1.3
		725.	-1.3	800.	-1.8	800.	-1.0	800.	-0.8	750.	-1.7	800.	-1.9
				850.	-2.0					800.	-1.5	850.	-1.0
										825.	-1.8		
										850.	-2.0		

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DATE	621024	DATE	621101	DATE	621109	DATE	621212	DATE	630104	DATE	630116	DATE	630122	DATE	630130
BRVV	1	BRVV	2	BRVV	3	BRVV	4	BRVV	5	BRVV	6	BRVV	7	BRVV	8
TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200
66.	7.8	65.	7.1	65.	6.1	71.	5.3	65.	5.0	65.	5.8	65.	5.9	65.	5.8
42.	6.1	43.	5.7	111.	3.3	82.	4.7	75.	3.3	78.	4.6	86.	4.6	76.	4.6
114.	2.0	103.	1.8	145.	1.8	111.	1.8	100.	2.3	100.	3.3	100.	3.7	100.	3.9
191.	.9	194.	.7	800.	.4	100.	.6	125.	1.0	125.	2.2	125.	2.3	125.	2.4
232.	-1.7	223.	-1.3	262.	-0.7	203.	-0.3	190.	-0.6	140.	-1.2	150.	-1.0	180.	-1.0
291.	-1.8	291.	-0.0	316.	-0.3	281.	-1.3	177.	-0.3	173.	-0.5	175.	-0.8	200.	-0.5
								288.	-1.1	201.	-0.6	226.	-0.1	225.	-0.1
										285.	-1.1				

DATE 630209	DATE 630213	DATE 630281	DATE 630287	DATE 630307	DATE 630313	DATE 630381	DATE 630402
BRVV							
TIME 1200							
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65. 5.8	68. 6.1	65. 5.8	74. 5.2	75. 5.1	68. 5.7	65. 6.0	66. 7.0
69. 3.9	108. 4.3	69. 3.6	100. 4.3	100. 4.5	75. 5.0	140. 6.7	77. 7.1
151. 1.0	125. 2.3	150. 1.2	125. 1.4	150. 3.8	100. 5.4	175. 8.6	140. 8.5
200. 0.8	151. 1.8	184. 2.0	175. 0.0	200. 2.3	125. 4.7	250. 6.0	175. 8.5
225. -0.8	182. 0.0	275. -0.1	800. -0.6	250. -0.8	150. 4.7	275. 6.6	200. 8.9
	225. -0.2		225. -0.1	380. -0.8	175. 4.8	320. 7.2	224. 9.6
				380. -1.0	200. 5.0	350. 6.6	250. 9.5
					250. 1.4	350. 5.6	300. 7.7
					300. -9	300. 5.5	325. 8.4
					333. -0.1	400. 4.6	350. 8.4
					370. -0.1	451. 8.8	300. 6.9
						475. 1.7	384. 5.2
						500. -0.5	406. 5.8
						520. -1.8	425. 1.4
							490. -3
							475. 0.0
							520. -1.4

DATE 630523	DATE 630611	DATE 630626	DATE 630712	DATE 630724	DATE 630807	DATE 630823	DATE 630905
BRVV							
TIME 1200							
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65. 7.1	69. 7.3	277. 8.6	68. 7.4	180. 8.5	65. 7.8	161. 8.5	300. 8.1
100. 8.0	94. 7.9	300. 7.6	100. 7.9	150. 8.6	100. 8.6	150. 8.8	304. 8.9
150. 8.8	150. 8.8	325. 9.8	142. 8.6	187. 8.7	141. 8.5	203. 8.8	325. 9.8
200. 8.8	190. 8.8	351. 9.2	150. 8.5	225. 9.3	180. 8.8	226. 9.4	351. 8.8
225. 9.8	224. 9.3	375. 1.3	177. 8.6	251. 9.1	203. 8.8	251. 9.3	
250. 9.9	249. 9.3	400. -5	200. 8.8	270. 8.9	220. 9.4	301. 8.1	
275. 8.5	277. 8.6	426. 0.0	225. 9.1	290. 7.8	251. 9.0	325. 6.6	
300. 7.9	301. 7.9	451. -0.8	250. 9.0	320. 9.9	276. 8.3	351. 8.3	
325. 8.1	183. 6.6		276. 8.6	350. 3.9	300. 7.2	370. 8.2	
340. 7.4	374. 2.9		301. 7.6	375. 8.0	380. 5.3	401. -9	
342. 5.1	401. 1.7		327. 5.3	400. -8	381. 4.5	451. -0.7	
375. 2.8	448. 6.6		350. 3.1	450. -0.2	375. 2.3		
421. -0	476. -0.9		376. -0	470. -0.8	420. 1.2		
451. -0.1			401. -0.1		451. -0.7		
470. -0.4			426. -0.7				

DATE	030625	DATE	031008	DATE	031020	DATE	031118	DATE	031231	DATE	040117	DATE	040214	DATE	040318
SRVY	25	SRVY	28	SRVY	27	SRVY	29	SRVY	29	SRVY	30	SRVY	31	SRVY	32
TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
150.	7.6	101.	7.4	143.	8.7	101.	7.6	143.	8.6	102.	7.6	167.	8.5	150.	8.5
151.	7.0	131.	7.4	151.	8.4	131.	7.6	141.	8.1	151.	7.5	130.	7.0	170.	8.0
175.	6.5	0.	7.5	170.	8.6	0.	7.5	178.	7.3	-1.	7.5	201.	6.1	202.	5.5
201.	8.8	60.	8.8	201.	8.8	60.	8.8	202.	5.5	50.	8.8	292.	1.7	227.	6.0
227.	7.3	63.	7.7	233.	9.0	63.	7.3	228.	8.0	62.	7.4	302.	0.6	232.	1.0
240.	8.0	101.	7.9	236.	9.7	143.	8.6	242.	3.1	125.	8.5	393.	0.7	270.	0.1
245.	5.8	140.	8.4	246.	8.5	191.	8.6	277.	2.7	180.	8.8	304.	0.7	304.	0.7
252.	0.9	151.	8.0	302.	7	177.	5.8	302.	8	167.	6.4	381.	0.1	381.	0.1
277.	3.0	177.	8.4	330.	01.1	203.	3.9	128.	0.2	151.	7.4				
303.	1.6	202.	8.8			292.	0.5	353.	01.1	201.	3.5				
328.	0.3	226.	9.3			276.	0.5	375.	01.0	252.	1.6				
353.	0.1	234.	8.4			328.	0.6	403.	02.4	303.	0.3				
		252.	5.3							392.	03.0				
		303.	1.3												
		326.	0.8												
		352.	0.2												
		379.	0.6												

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DATE	040409	DATE	040527	DATE	040628	DATE	040831	DATE	040928	DATE	041203	DATE	050120	DATE	050428
SRVY	33	SRVY	34	SRVY	35	SRVY	36	SRVY	37	SRVY	38	SRVY	39	SRVY	40
TIME	1200														
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150.	6.5	138.	8.4	141.	9.5	63.	7.0	-101.	7.5	161.	5.4	02.	7.0	62.	7.5
170.	6.3	144.	8.6	167.	7.7	140.	8.0	-50.	7.5	176.	6.7	142.	5.4	170.	6.2
227.	3.0	177.	7.0	191.	4.0	105.	7.6	0.	7.8	201.	2.5	151.	4.7	227.	2.2
277.	1.4	201.	6.1	232.	3.2	101.	6.8	59.	8.0	226.	1.3	176.	3.0	328.	0.5
327.	0.3.0	213.	5.7	271.	1.5	221.	8.0	63.	7.5	252.	0.0	202.	2.1	383.	02.0
352.	0.2.8	226.	5.7	301.	0.0	241.	2.7	100.	6.0	277.	0.6	252.	0.4		
377.	0.2.0	252.	1.3	340.	-2.2	267.	0.7	141.	8.8	302.	01.5	270.	0.1		
453.	0.2.0	277.	0.0			502.	0.6	151.	3.3	327.	02.6	320.	0.2		
470.	0.2.8	302.	01.0			314.	03.1	161.	2.6	382.	03.2	351.	02.0		
		327.	02.8			342.	01.5	102.	1.0						
								101.	0.9						
								201.	0.8						
								226.	0.0						

DATE 650908	DATE 651026	DATE 651220	DATE 660124	DATE 660320	DATE 660428	DATE 661103	DATE 670118
BRVY 41	BRVY 42	BRVY 43	BRVY 44	BRVY 45	BRVY 46	BRVY 47	BRVY 48
TIME 1200							
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62. 7.3	61. 7.2	136. 7.2	130. 6.5	139. 5.4	130. 2.7	140. 5.2	150. 5.2
101. 6.9	101. 7.0	101. 7.0	175. 5.3	174. 3.3	100. 0.1	150. 0.8	200. 2.7
151. 6.3	152. 5.6	152. 6.0	225. 1.5	200. 2.6	107. 0.7	200. 1.0	225. 1.2
176. 7.0	176. 3.8	176. 4.4	250. -0.3	285. -0.8	225. -0.3	250. -0.3	260. 0.0
202. 4.5	226. 1.0	201. 3.5	200. -0.5	250. -0.7	250. -1.5	270. -0.0	275. -0.8
227. 2.0	303. -0.6	277. 1.8	300. -0.5	276. -0.3	275. -0.8	325. -0.0	325. -0.8
252. -0.4	326. -1.0	252. -0.8	525. -0.3	300. -2.0	300. -2.0		
277. -0.4	352. -1.5	277. -1.3		350. -2.0			
327. -0.6	378. -0.0	342. -0.6					
377. -0.1		353. -2.0					
		378. -2.0					
		403. -3.0					

DATE 670503	DATE 670615	DATE 670919	DATE 671213	DATE 680118	DATE 680128	DATE 680130	DATE 680208
BRVY 49	BRVY 50	BRVY 51	BRVY 52	BRVY 53	BRVY 54	BRVY 55	BRVY 56
TIME 1200							
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139. 4.6	140. 5.5	130. 5.3	140. 5.3	150. 2.0	140. 3.0	140. 3.0	130. 6.0
174. 2.7	150. 7.0	200. 2.5	175. 2.1	150. 2.7	150. 2.0	150. 2.7	150. 3.4
225. -0.3	160. 7.0	220. -0.9	200. -1.1	800. -0.0	181. -0.8	175. 1.5	200. 1.2
250. -0.4	200. 6.8	300. -0.5	225. -0.6	250. -1.0	200. -0.2	200. -0.0	250. 0.5
300. -0.1	225. 2.2	350. -0.3	250. -0.1	300. -0.8	250. -0.4	225. -0.8	275. -1.2
325. -1.0	250. -0.7		300. -1.2	300. -1.0	250. -0.3	250. -0.3	
351. -2.0	301. -0.0		325. -0.7	320. -0.5	275. -0.1	275. -0.1	
370. -3.0	320. -0.5		351. -0.0	300. -1.6	300. -0.8		
			375. -0.7	325. -0.5			

DATE 680215	DATE 680221	DATE 680226	DATE 680307	DATE 680313	DATE 680322	DATE 681007	DATE 681025
BRVY 57	BRVY 58	BRVY 59	BRVY 60	BRVY 61	BRVY 62	BRVY 63	BRVY 64
TIME 1200							
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140. 4.3	140. 0.7	100. 5.3	140. 5.0	180. 3.0	141. 3.0	140. 0.8	140. 7.2
151. 3.0	150. 3.0	150. 4.2	150. 3.5	152. 3.3	150. 3.4	150. 7.0	150. 7.3
200. -1.3	130. 1.9	153. 3.8	175. 2.8	200. 1.3	175. 2.7	167. 7.7	175. 7.8
251. 0.0	175. 2.0	175. 2.3	200. 1.8	250. -0.5	200. 1.0	190. 5.7	200. 6.2
301. -1.5	200. 1.1	200. 1.2	225. -0.7	275. -1.2	251. -0.3	200. 4.2	225. 2.2
350. -0.0	225. -0.7	275. -0.3	250. -0.3	301. -0.2	275. -0.6	225. 1.0	250. -0.7
400. -0.6	250. -0.2	250. -0.6	275. -0.1		301. -2.6	250. -0.5	275. -0.5
	275. -0.5	275. -0.1				275. -0.0	300. -0.1
	300. -0.0	300. -0.0				300. -0.5	
	325. -0.2	325. -0.7				325. -0.2	
		350. -0.5				350. -0.0	

DATE 681113	DATE 681220	DATE 690113	DATE 690122	DATE 690129	DATE 690205	DATE 690212	DATE 690219						
BRVY													
TIME													
-----	-----	-----	-----	-----	-----	-----	-----						
180.	3.8	180.	5.1	180.	8.1	180.	2.1	180.	7.6	180.	2.9	180.	2.3
180.	3.4	180.	4.7	180.	3.7	180.	1.6	180.	1.7	180.	2.0	180.	1.8
175.	2.5	175.	3.5	175.	2.5	175.	.7	175.	.9	175.	.7	175.	1.0
200.	1.0	200.	2.0	200.	1.0	200.	.1	200.	.2	200.	.3	200.	.2
225.	1.0	225.	.7	225.	.6	225.	.6	225.	.1	225.	.7	225.	.6
250.	0.0	250.	-.5	300.	-.1	250.	-.1	250.	-.1	300.	-.3	250.	-.1
275.	-.2	275.	-.1	350.	-.5	275.	-.1	275.	-.6	350.	-.3	275.	-.1
300.	-.1	300.	-.2			300.	-.2	300.	-.8			300.	-.2
325.	-.2	325.	-.1			325.	-.2					325.	-.2
350.	-.3												

DATE 690226	DATE 690304	DATE 690312	DATE 690319	DATE 690527	DATE 690723	DATE 691023	DATE 691120						
BRVY													
TIME													
-----	-----	-----	-----	-----	-----	-----	-----						
180.	2.3	180.	1.8	180.	1.6	180.	2.4	180.	3.8	180.	7.0	180.	4.7
180.	1.4	180.	1.5	180.	.9	180.	2.0	180.	3.1	180.	4.8	180.	4.5
175.	-.4	175.	.7	175.	.2	175.	1.1	200.	.1	200.	1.0	175.	3.1
200.	-.4	200.	-.2	200.	-.2	200.	-.3	250.	-.2	250.	-.5	200.	1.8
225.	-.1	225.	1.2	225.	-.4	250.	-.1	300.	-.1	300.	-.2	225.	-.4
250.	0.1	250.	-.2	250.	-.1	300.	-.2	350.	-.2	350.	-.1	250.	0.0
275.	0.1	100.	0.3	275.	-.1	350.	-.3	350.	-.2	350.	-.4	275.	0.0
300.	-.3	350.	0.6	300.	-.2					300.	-.6	300.	0.0
400.	0.3	325.	-.2									325.	0.1
450.	-.5	340.	0.3										
480.	-.8	380.	0.3										

DATE 691216	DATE 700114	DATE 700121	DATE 700128	DATE 700204	DATE 700211	DATE 700218	DATE 700225						
BRVY													
TIME													
-----	-----	-----	-----	-----	-----	-----	-----						
180.	3.5	180.	3.2	180.	3.0	180.	3.6	180.	1.5	180.	2.0	180.	3.3
180.	2.4	180.	2.9	180.	3.0	180.	3.3	180.	1.1	180.	1.9	180.	2.6
200.	-.4	200.	1.1	200.	1.1	175.	1.8	200.	-.7	200.	-.1	175.	1.7
225.	-.2	225.	-.8	250.	-.8	200.	-.6	250.	0.1	250.	-.6	200.	0.8
300.	0.1	300.	0.1	300.	0.1	250.	-.7	300.	0.1	300.	0.8	225.	0.1
350.	0.2	350.	0.2	350.	0.2	300.	0.1	380.	0.2	380.	0.3	250.	0.0
375.	0.3	400.	0.0	380.	0.0	380.	0.0			300.	0.9	275.	0.8
										350.	0.8	300.	0.2
												380.	0.3

DATE 700304	DATE 700311	DATE 700318	DATE 700518	DATE 700826	DATE 701015	DATE 701106	DATE 701208
BRVY 49	BRVY 40	BRVY 41	BRVY 92	BRVY 93	BRVY 94	BRVY 95	BRVY 96
TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200
-----	-----	-----	-----	-----	-----	-----	-----
140. -4.3	140. -4.4	140. -4.3	140. -3.1	140. 7.3	140. 7.4	140. 7.4	140. 7.4
150. 3.8	150. 4.0	150. 3.5	150. 4.0	150. 7.9	150. 8.0	150. 8.1	150. 8.2
200. 1.3	200. -1.9	200. -1.8	190. -1.8	200. 8.0	200. 7.9	200. 8.0	200. 8.3
250. 5.6	250. -5.5	250. -5.3	200. -5.0	250. 7.8	250. 7.8	250. 6.2	250. 5.7
300. -1.5	300. -1.5	300. -1.0	250. -2.2	300. 8.1	300. 8.3	300. 8.9	300. 8.7
350. -2.8	350. -2.6	350. -2.5	350. -2.2	350. 9.2	350. 9.3	350. 9.9	350. 9.6
400. 4.0	400. 4.3	380. -6.0	380. -6.0	380. 8.2	380. 8.2	380. -6.4	380. -1.0
450. 3.3	450. 3.3	450. 3.3	450. 3.3	450. 3.8	450. 3.8	450. -1.0	450. -2.3
500. 0.0	500. 0.0	500. 0.0	500. 0.0	500. 0.0	500. 0.0	500. 0.0	500. 0.0
550. -1.2	550. -2.4	550. -3.0	550. -3.0	550. 0.0	550. 0.0	550. 0.0	550. 0.0
600. -4.3	600. -4.3	600. -4.3	600. -4.3	600. -4.3	600. -4.3	600. -4.3	600. -4.3

DATE 701218	DATE 710113	DATE 710209	DATE 710511	DATE 710612	DATE 710607	DATE 710816	DATE 711004
BRVY 67	BRVY 94	BRVY 69	BRVY 100	BRVY 101	BRVY 102	BRVY 103	BRVY 104
TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200
-----	-----	-----	-----	-----	-----	-----	-----
140. -8.3	140. -8.4	140. -8.3	140. -8.5	140. 5.8	140. 6.1	140. 6.7	140. 5.1
150. 8.4	150. 8.3	150. 8.8	150. 8.1	150. 5.3	150. 6.8	150. 7.1	150. 6.2
200. 8.3	200. 5.3	161. 7.8	200. 4.9	200. 3.7	172. 7.0	195. 6.7	200. 3.1
250. 6.2	250. 5.3	162. 7.2	250. 1.6	235. 3.4	200. 5.4	250. 1.1	250. 1.2
300. 3.6	300. -7	280. 6.2	300. -1.7	250. -8	225. 3.0	300. -1.9	300. -2.2
350. 1.3	350. -1.4	280. 1.5	300. -2.2	300. -2.2	250. -9	350. -2.3	350. -2.3
375. -1.3	375. -3.1	380. -1.1	350. -2.6	350. -2.6	300. -3.1	400. -3.3	400. -3.3
375. -6.6	375. -2.8	375. -2.8	375. -2.8	375. -2.8	375. -2.8	375. -2.8	375. -2.8

DATE 711213	DATE 720110	DATE 720218	DATE 720522	DATE 720317	DATE 720410	DATE 720521	DATE 721020
BRVY 105	BRVY 106	BRVY 107	BRVY 108	BRVY 109	BRVY 110	BRVY 111	BRVY 112
TIME 1200							
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140. 8.2	140. 8.2	140. 4.0	140. 3.3	140. 4.3	140. 5.6	140. 7.1	140. 5.1
150. 8.1	150. 8.2	150. 3.6	150. 2.8	150. 3.9	150. 5.1	150. 7.3	150. 6.6
160. 6.0	160. 7.5	200. 1.6	200. 1.1	200. 1.6	174. 4.8	161. 7.9	200. 1.7
200. 5.0	200. 3.7	240. -0.2	250. -0.4	250. -0.3	200. 1.9	167. 6.1	250. 0.9
213. 4.3	250. 0.0	300. -1.0	275. -1.0	305. -2.3	250. -1.8	175. 5.8	275. -1.0
250. -1.3	300. -1.7	350. -0.2	350. -0.2	275. -1.0	200. 4.3	225. 1.2	250. -0.8
300. -1.6	350. -2.0	350. -2.0	350. -2.0	350. -2.0	300. -2.3	300. -2.3	300. -2.3

DATE	T2120X	DATE	T3010S	DATE	T3021S	DATE	T3031S	DATE	T3032S	DATE	T3040S	DATE	T3041S
BRVV	113	BRVV	116	BRVV	115	BRVV	116	BRVV	117	BRVV	118	BRVV	119
TIME	1300	TIME	1000	TIME	1400	TIME	0800	TIME	0600	TIME	1300	TIME	1200
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100.	5.8	100.	5.1	100.	4.1	100.	3.6	100.	3.7	100.	4.5	100.	3.2
150.	5.9	150.	5.0	150.	3.8	150.	3.7	150.	3.5	150.	3.2	150.	5.0
175.	5.1	175.	1.3	175.	2.0	175.	1.4	175.	1.2	175.	1.8	175.	2.0
200.	1.7	200.	-1.4	200.	-1.0	200.	-2.0	200.	-1.2	200.	-1.9	200.	1.0
225.	-1.3							213.	-2.0	225.	-2.2	225.	-0.8
250.	-1.7									250.	-1.0	250.	-2.8

DATE 021024	DATE 021101	DATE 021109	DATE 021212	DATE 030109	DATE 030116	DATE 030122	DATE 030130						
BRVY 1	BRVY 2	BRVY 3	BRVY 4	BRVY 5	BRVY 6	BRVY 7	BRVY 8						
TIME 1200	TIME 1800	TIME 1200	TIME 1200	TIME 1800	TIME 1800	TIME 1200	TIME 1200						
-----	-----	-----	-----	-----	-----	-----	-----						
15.	8.8	17.	8.8	38.	8.3	9.0	9.0	27.	8.8	151.	8.0	11.	9.0
33.	9.8	34.	9.3	101.	7.3	41.	8.7	25.	9.0	73.	8.8	201.	8.0
77.	8.5	77.	8.4	108.	5.5	145.	9.1	50.	8.7	100.	7.5	280.	8.0
117.	7.1	114.	8.8	213.	6.1	219.	2.1	75.	8.2	151.	6.1	301.	7.3
169.	9.9	107.	8.8	208.	1.7	204.	2.1	101.	7.2	175.	5.8	328.	6.4
223.	6.1	217.	8.0	382.	0.0	957.	-1.0	180.	6.6	200.	4.4	350.	7.1
280.	1.0	264.	1.0	408.	-1.0	418.	-2.0	150.	5.0	249.	2.6	300.	0.8
345.	-0.7	281.	1.3	508.	-2.0	497.	-0.1	201.	4.4	299.	-0	226.	3.5
411.	-1.7	319.	-0.3	580.	-3.0	451.	-0.7	326.	-0.6	375.	-2.3	250.	2.7
		308.	-0.9			361.	1.2	350.	-1	288.	3.8		
						350.	-0.1	370.	0.0	200.	1.9		
						377.	0.6	401.	0.4	300.	1.4		
						401.	-0.0	425.	-0.8	320.	-0.8		
						425.	-0.8			351.	0.0		
										376.	0.5		
										491.	0.6		
										520.	0.1		

DATE 630205	DATE 630213	DATE 630281	DATE 630227	DATE 630307	DATE 630313	DATE 630321	DATE 630408
BRVV							
TIME 1200							
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0.	9.8	50.	8.6	-1.	9.6	125.	6.7
24.	9.0	75.	8.8	24.	8.9	151.	8.0
49.	8.8	99.	7.4	49.	8.8	178.	5.2
75.	8.3	126.	8.9	180.	7.5	200.	4.8
100.	7.5	150.	6.0	125.	4.8	227.	3.7
125.	6.9	181.	5.4	190.	5.0	150.	2.5
150.	6.0	200.	6.9	202.	4.2	175.	1.4
177.	5.4	230.	3.0	227.	3.7	100.	7.5
201.	4.5	301.	1.8	230.	2.9	225.	4.1
223.	3.6	301.	-0.1	277.	1.9	270.	0.0
251.	2.7	370.	-0.1	301.	1.3	351.	-0.5
276.	1.7	320.	-0.8	320.	-0.5	370.	-0.7
301.	1.0	350.	0.0	350.	0.0	377.	-0.4
325.	-1.2	375.	-0.7	375.	-0.9	351.	-0.6
351.	-0.2	400.	-0.1	400.	-1.3	370.	-0.7
376.	-0.7	400.	-0.1	400.	-1.3	370.	-0.1
409.	-0.8	400.	-0.1	400.	-1.3	370.	-0.1

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DATE 6305P3	DATE 630611	DATE 630626	DATE 630712	DATE 630724	DATE 630807	DATE 630823	DATE 630808
BRVV							
TIME 1200							
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-1.	10.0	0.	10.1	158.	10.4	0.	10.3
50.	9.0	50.	8.9	200.	9.8	50.	8.9
100.	9.5	100.	9.4	250.	10.2	100.	9.8
150.	10.4	180.	10.3	275.	9.6	150.	10.6
200.	9.5	200.	8.9	375.	7.7	175.	10.3
221.	10.3	250.	10.2	350.	9.2	200.	10.5
300.	8.5	275.	9.8	350.	9.0	250.	10.9
300.	6.0	330.	7.8	374.	1.0	200.	9.8
302.	4.5	352.	5.4	375.	0.9	250.	10.1
374.	1.8	375.	2.1	410.	-1.0	300.	8.8
400.	-0	427.	.7	372.	2.4	340.	4.9
451.	-0.3	474.	-0.7	401.	1.0	373.	2.8
501.	-1.3	500.	-0.1	430.	-0.6	400.	1.8

DATE	031929	DATE	031909	DATE	031928	DATE	031116	DATE	031231	DATE	040117	DATE	040216	DATE	040212
BRVY	25	BRVY	26	BRVY	27	BRVY	28	BRVY	29	BRVY	30	BRVY	31	BRVY	32
TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
70.	9.2	61.	9.9	175.	9.9	61.	9.9	61.	9.9	0.	10.0	50.	8.8	0.	9.9
101.	9.7	84.	9.9	201.	9.9	24.	9.9	24.	9.9	50.	8.8	101.	9.9	50.	9.9
125.	10.5	50.	9.9	227.	10.0	50.	9.9	50.	8.8	101.	9.5	151.	10.2	100.	9.9
175.	9.8	76.	9.9	252.	9.9	74.	9.9	74.	8.9	191.	10.4	201.	9.7	191.	10.5
201.	9.8	121.	10.4	276.	9.8	125.	10.3	108.	9.9	201.	9.9	252.	10.0	201.	9.9
227.	10.0	151.	10.3	327.	9.3	151.	10.3	151.	10.2	252.	9.8	287.	9.9	251.	10.0
252.	9.5	175.	9.9	344.	9.3	176.	9.7	177.	10.0	274.	9.1	302.	9.7	281.	9.0
277.	9.3	207.	10.0	404.	9.3	201.	9.4	201.	9.5	277.	8.1	338.	9.2	302.	9.8
303.	5.2	227.	10.3	428.	9.4	226.	9.8	237.	9.8	303.	9.8	403.	1.3	326.	9.1
326.	4.3	253.	9.0	486.	9.0	251.	9.7	252.	9.8	353.	3.2	456.	2.9	355.	2.6
353.	3.1	303.	9.8	477.	9.9	276.	9.7	403.	1.8	388.	9.6	377.	1.5		
388.	-0.1	326.	3.4	302.	9.8	241.	8.9	454.	-2			803.	-0.9		
422.	-0.3	353.	1.3	353.	1.3	312.	9.8	508.	-3			454.	-0.8		
402.	-0.3	403.	-0.7	403.	-0.7	327.	5.4	593.	-3.8			508.	-0.8		
426.	-0.3	428.	-0.1	342.	3.3	378.	1.8					530.	-0.6		
454.	-0.9			493.	1.8	493.	1.8					542.	-0.6		
				927.	1.1										
				479.	0.8										
				929.	-3.0										

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DATE	040527	DATE	040628	DATE	040831	DATE	040929	DATE	041203	DATE	040120	DATE	040428		
BRVY	33	BRVY	38	BRVY	35	BRVY	36	BRVY	38	BRVY	39	BRVY	40	BRVY	40
TIME	1200	TIME	1200												
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-1.	9.9	-1.	9.9	-1.	9.9	0.	9.5	0.	9.8	0.	9.8	0.	10.6	0.	9.7
50.	8.9	50.	8.8	40.	9.1	50.	8.9	50.	8.9	85.	9.0	60.	9.0		
101.	9.6	100.	9.6	100.	9.7	100.	9.5	100.	9.5	101.	9.5	105.	9.9		
150.	10.3	151.	10.1	151.	10.6	151.	10.3	150.	10.4	151.	10.1	191.	10.4	182.	10.4
201.	9.8	202.	9.5	201.	9.3	201.	9.6	201.	9.6	201.	9.3	241.	9.7	212.	9.5
251.	10.4	264.	9.6	242.	9.8	251.	9.6	241.	9.8	241.	8.9	292.	8.5	267.	7.7
275.	9.7	287.	6.3	267.	8.9	301.	8.2	251.	8.3	251.	8.0	302.	6.4	301.	4.0
292.	8.0	307.	9.8	289.	9.8	339.	8.8	279.	8.8	301.	8.8	342.	6.7	313.	5.1
304.	5.3	352.	3.9	352.	8.8	352.	9.7	361.	8.7	392.	2.1	393.	8.6	363.	0.1
352.	2.6	408.	1.0	402.	-3	402.	1.0	392.	2.6	402.	-1	484.	1.3	413.	-1.3
402.	-0.1	453.	-2.4	452.	-1.9	452.	-0.6	462.	1.0	452.	-1.9	494.	0.0		
453.	-0.3			476.	-2.1	480.	-1.0	492.	-0.1	483.	-2.2	546.	-1.0		
503.	-3.3			503.	-1.8	493.	-0.1			589.	-2.7				

DATE 650908	DATE 651028	DATE 651220	DATE 660124	DATE 660328	DATE 660426	DATE 661103	DATE 670118
BRVY 41	BRVY 42	BRVY 43	BRVY 44	BRVY 45	BRVY 46	BRVY 47	BRVY 48
TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200
50.	5.9	0.	10.1	0.	10.2	0.	10.3
100.	9.0	51.	9.1	50.	9.1	51.	9.1
151.	10.4	501.	9.5	141.	9.8	100.	9.5
201.	6.1	151.	10.4	151.	10.5	150.	10.4
251.	1.8	201.	9.8	201.	9.7	201.	9.7
301.	0.1	251.	8.4	251.	8.4	251.	8.4
351.	0.1	301.	5.8	301.	7.6	301.	4.2
401.	0.1	351.	1.8	351.	2.0	351.	2.1
451.	0.1	401.	0.5	401.	0.9	401.	0.6
501.	0.1	451.	0.2	451.	0.1	451.	0.1
551.	0.1	501.	-2.6	551.	-2.6	501.	-1.4

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DATE 670503	DATE 670915	DATE 670919	DATE 671113	DATE 680115	DATE 680184	DATE 680130	DATE 680208
BRVY 49	BRVY 50	BRVY 51	BRVY 52	BRVY 53	BRVY 54	BRVY 55	BRVY 56
TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200
0.	10.8	0.	10.8	0.	10.8	0.	10.8
51.	9.0	50.	9.0	50.	9.0	50.	9.0
101.	9.5	100.	9.6	100.	9.6	100.	9.6
151.	10.3	151.	10.4	150.	10.2	171.	10.1
201.	10.0	171.	9.7	201.	9.6	171.	9.8
251.	7.2	141.	7.1	231.	7.6	200.	5.7
301.	5.1	201.	6.3	250.	4.9	251.	3.2
351.	4.2	251.	6.1	301.	1.0	251.	2.8
401.	1.9	301.	5.8	351.	1.3	301.	1.2
451.	0.7	351.	3.9	400.	0.3	350.	0.8
501.	0.1	401.	0.3	451.	-1.1	400.	-1.0
551.	0.0	451.	-1.1	500.	-0.1	450.	-0.1
601.	0.4	500.	-0.1	551.	-0.1	500.	-0.4
651.	0.1	551.	-0.1	600.	-0.1	550.	-0.3
701.	0.2	600.	-0.1	651.	-0.1	600.	-0.2

DATE 680213	DATE 680214	DATE 680224	DATE 680307	DATE 680313	DATE 680328	DATE 681007	DATE 681025
BRVY 57	BRVY 58	BRVY 59	BRVY 60	BRVY 61	BRVY 62	BRVY 63	BRVY 64
TIME 1800							
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0, 10.2	0, 10.7	-1, 10.2	0, 10.3	0, 10.5	-1, 10.2	0, 10.4	0, 10.5
50, 9.6	50, 9.8	40, 9.9	50, 9.9	50, 9.9	50, 9.9	50, 9.9	50, 9.9
100, 9.7	100, 9.9	100, 9.5	100, 9.7	100, 9.8	100, 9.8	100, 9.8	100, 9.8
150, 9.6	150, 9.9	130, 10.0	150, 10.1	150, 10.0	150, 10.0	150, 10.0	150, 10.0
180, 9.8	180, 9.9	140, 9.9	180, 9.7	180, 9.6	180, 9.5	180, 9.4	180, 9.3
200, 9.8	200, 9.9	140, 9.9	200, 9.8	200, 9.9	200, 9.9	200, 9.9	200, 9.9
220, 9.8	200, 9.9	140, 9.9	220, 9.9	220, 9.9	220, 9.9	220, 9.9	220, 9.9
250, 9.1	250, 9.9	250, 9.9	250, 9.9	250, 9.9	250, 9.9	250, 9.9	250, 9.9
300, -1, 1	300, -1, 0	300, -1, 0	350, -1, 3	350, -1, 7	300, -1, 4	300, -1, 1	350, -1, 3
350, -1, 3	350, -1, 1	350, -1, 0	400, -1, 6	400, -1, 6	350, -1, 6	350, -1, 9	275, -1, 1
400, -1, 9	400, -1, 6	400, -1, 0	450, -1, 3	450, -1, 3	400, -1, 0	300, -1, 3	300, -1, 3
450, -1, 9	425, -1, 9	500, -1, 9	450, -1, 9	450, -1, 9	450, -1, 9	350, -1, 9	375, -1, 8

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DATE 690119	DATE 690200	DATE 690118	DATE 690122	DATE 690124	DATE 690205	DATE 690212	DATE 690219
BRVY 65	BRVY 66	BRVY 67	BRVY 68	BRVY 69	BRVY 70	BRVY 71	BRVY 72
TIME 1800							
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0, 10.5	0, 10.4	0, 10.6	0, 10.6	0, 10.4	0, 10.8	0, 10.6	0, 10.5
50, 9.0	50, 9.0	40, 9.1	50, 9.0	50, 9.1	50, 9.0	50, 9.0	50, 9.0
100, 9.5	100, 9.3	100, 9.4	100, 9.4	100, 9.5	100, 9.3	100, 9.3	99, 9.4
150, 9.3	125, 9.9	100, 9.2	100, 9.5	100, 9.4	100, 9.3	100, 9.2	101, 9.4
180, 9.9	150, 9.7	125, 9.9	100, 9.5	100, 9.4	110, 9.5	111, 9.6	150, 9.6
200, 9.0	175, 9.2	150, 9.0	150, 9.4	150, 9.1	150, 9.2	125, 9.0	200, 9.2
250, 9.0	200, 9.9	175, 9.2	200, 9.8	200, 9.8	200, 9.7	150, 9.2	250, 9.6
300, 1, 4	250, 9.9	200, 9.6	250, 9.8	250, 9.8	175, 9.9	200, 9.1	300, 9.8
350, -1, 1	300, -1, 7	250, -1, 8	300, -1, 6	250, -1, 6	200, -1, 1	200, -1, 1	350, -1, 6
400, -1, 7	350, -1, 0	300, -1, 1	350, -1, 7	100, -1, 1	350, -1, 9	250, -1, 5	400, -1, 6
450, -1, 7	400, -1, 6	350, -1, 8	375, -1, 7	450, -1, 4	300, -1, 0	300, -1, 2	350, -1, 1
500, -1, 9	450, -1, 9	400, -1, 1	400, -1, 9	400, -1, 9	400, -1, 7	350, -1, 7	450, -1, 6

DATE	890228	DATE	890305	DATE	890312	DATE	890319	DATE	890326	DATE	891023	DATE	891120	DATE	891210
BRVV	73	BRVV	74	BRVV	75	BRVV	76	BRVV	77	BRVV	78	BRVV	80	BRVV	81
TIME	1200														
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0.	10.4	0.	10.4	0.	10.4	0.	10.7	0.	10.7	0.	10.3	0.	10.3	0.	10.3
50.	9.0	50.	9.7	40.	8.0	50.	8.7	50.	8.4	50.	8.4	25.	8.9	50.	9.0
45.	9.3	97.	9.0	45.	9.2	45.	9.0	100.	7.3	90.	9.1	50.	8.9	91.	9.1
100.	7.6	100.	7.9	90.	8.2	90.	7.9	100.	6.7	100.	7.4	92.	9.1	47.	8.8
150.	5.8	150.	5.8	150.	5.9	150.	5.7	200.	6.5	140.	6.1	100.	8.2	150.	8.8
200.	3.9	200.	4.4	200.	4.2	200.	4.5	250.	6.2	180.	6.2	150.	6.9	200.	8.8
250.	1.8	220.	1.9	250.	1.0	250.	1.4	300.	3.6	200.	5.3	200.	5.7	250.	8.4
300.	0.0	250.	1.2	300.	-1.1	300.	-2	350.	1.8	200.	5.6	210.	5.1	300.	-1.6
350.	-1.4	300.	-1.3	350.	-1.0	350.	-1.0	400.	0.0	275.	4.9	250.	3.9	350.	-0.8
400.	-2.1	350.	-1.3	400.	-1.4	400.	-0.5	450.	-1.8	300.	3.2	300.	1.8	400.	-1.9
450.	-2.3	400.	-2.3	450.	-0.0	450.	-2.3	500.	1.8	350.	1.8	350.	-0.4	450.	-2.7
500.	-3.4	450.	-3.4	500.	-3.4	500.	-3.4	550.	-2.4	400.	-2.3	400.	-2.3	500.	-3.8
550.	-3.7	500.	-3.7	550.	-3.7	550.	-3.7	600.	-2.3	450.	-3.6	450.	-3.6	550.	-4.0
600.	-4.5	550.	-4.5	600.	-4.5	600.	-4.5	650.	-3.5	500.	-3.5	500.	-3.5	600.	-4.5

DATE	700114	DATE	700121	DATE	700128	DATE	700204	DATE	700211	DATE	700218	DATE	700225	DATE	700308
BRVV	82	BRVV	83	BRVV	84	BRVV	85	BRVV	86	BRVV	87	BRVV	88	BRVV	89
TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200
----	-----	----	-----	----	-----	----	-----	----	-----	----	-----	----	-----	----	-----
0.	10.5	0.	10.7	0.	10.5	0.	10.3	0.	10.9	0.	10.8	0.	10.8	0.	10.5
50.	9.4	90.	9.1	40.	8.0	50.	8.4	70.	8.8	50.	8.8	50.	8.8	50.	8.9
40.	9.0	92.	9.3	48.	9.1	50.	9.0	81.	9.1	100.	8.8	90.	8.8	44.	8.8
100.	8.5	100.	8.7	100.	8.4	88.	9.2	100.	8.6	125.	7.1	100.	8.3	100.	8.3
125.	7.0	150.	8.0	140.	9.8	100.	8.6	150.	5.3	150.	9.4	120.	6.2	150.	5.7
150.	5.8	200.	4.8	200.	8.3	114.	7.6	200.	3.1	175.	9.1	150.	5.3	175.	6.9
200.	4.2	250.	2.3	240.	2.0	115.	6.8	250.	1.0	200.	3.8	175.	6.7	200.	3.6
250.	2.2	300.	-1.8	300.	-0.6	150.	4.3	300.	-0.7	250.	1.4	200.	1.4	250.	1.0
300.	-1.4	350.	-0.6	350.	-0.9	300.	5.3	350.	-1.0	300.	0.2	250.	-1.7	300.	-0.2
350.	-0.9	400.	-1.8	400.	-0.8	350.	1.3	400.	-2.5	350.	-1.8	300.	0.5	350.	-1.5
400.	-1.9	450.	-2.7			300.	-1.1			400.	-1.7	350.	-1.9	400.	-2.8
450.	-2.4					350.	-1.0			450.	-0.8	400.	-0.8		
500.	-3.7					400.	-0.9			500.	-0.8	450.	-0.8		

DATE	T00311	DATE	T00312	DATE	T00318	DATE	T00320	DATE	T01015	DATE	T01108	DATE	T01109	DATE	T011218
BRVY	90	BRVY	91	BRVY	92	BRVY	93	BRVY	94	BRVY	95	BRVY	96	BRVY	97
TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200
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00.	10.4	5.	10.9	0.	10.5	0.	10.3	0.	10.2	0.	10.4	0.	10.6	0.	10.4
50.	9.0	5.7	9.0	90.	8.8	50.	8.4	50.	8.4	50.	8.8	50.	8.4	50.	8.8
93.	9.0	6.2	9.9	97.	9.0	65.	8.8	100.	8.2	66.	9.0	100.	8.4	50.	8.9
100.	8.8	15.7	5.8	180.	8.1	115.	7.6	150.	8.2	104.	8.3	190.	7.9	68.	9.1
150.	5.8	200.	3.8	117.	6.9	150.	4.3	172.	8.6	119.	7.9	200.	9.4	106.	8.3
200.	3.7	210.	1.3	190.	3.3	173.	4.6	160.	10.0	150.	8.2	250.	8.9	117.	7.8
250.	1.3	100.	.7	200.	4.0	189.	4.8	200.	10.2	192.	9.8	275.	8.8	150.	8.2
300.	.3	100.	.4	250.	1.5	200.	10.2	288.	8.8	200.	10.1	300.	9.9	200.	10.1
350.	.4	000.	1.7	300.	.4	222.	10.3	300.	9.1	250.	8.9	350.	3.4	228.	10.1
400.	-1.0	050.	-2.7	350.	-1.5	249.	8.4	338.	8.9	204.	9.1	400.	.6	232.	8.8
450.	-2.3	900.	-3.1	400.	-8.7	250.	8.0	350.	9.2	288.	9.9	450.	-6.4	250.	7.8
500.	-3.3			300.	8.3	400.	2.0	300.	8.4	300.	9.8	500.	-1.0	300.	4.8
550.	-3.7			315.	8.8	450.	.8	350.	1.8			350.	1.8	350.	1.8
600.				350.	9.8	500.	-1.7	400.	1.2			400.	1.2	400.	1.2
650.				400.	1.5	550.	-3.1	450.	-1.0			450.	-1.0	485.	-6.3

DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME
7/10/11 8	12:00	7/10/20 9	12:00	7/10/81 1	12:00	7/10/61 2	12:00	7/10/67 7	12:00	7/10/81 8	12:00	7/11/00 9	12:00
8/11	04	8/11/10 0	04	8/11/10 1	04	8/11/10 2	04	8/11/10 3	04	8/11/10 4	04	8/11/10 5	04
TIME	12:00												
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0.	10.5	0.	10.0	0.	10.5	0.	10.6	0.	10.6	0.	10.4	0.	10.4
50.	8.8	50.	8.9	50.	8.8	50.	8.9	50.	8.9	50.	7.4	50.	8.9
100.	8.0	100.	7.6	100.	8.0	100.	8.4	100.	8.1	100.	8.0	100.	8.1
150.	7.2	119.	7.3	100.	8.2	125.	7.1	140.	7.5	150.	7.7	150.	7.7
200.	7.0	150.	8.1	150.	7.2	150.	7.0	200.	7.6	203.	9.6	200.	9.3
250.	9.9	200.	10.0	150.	8.0	200.	9.8	207.	9.8	219.	8.6	250.	9.3
300.	9.6	227.	9.6	200.	9.6	210.	9.7	220.	8.5	250.	9.6	300.	9.6
350.	6.4	232.	8.0	215.	9.4	212.	7.6	250.	9.0	300.	9.9	350.	1.0
400.	8.0	253.	8.8	233.	9.6	250.	5.0	300.	9.1	330.	1.0	400.	1.3
450.	3.3	250.	7.2	290.	3.1	300.	3.2	450.	7	400.	8.9	450.	9.1
500.	1.0	300.	2.9	300.	2.0	350.	0	400.	-1.6	450.	-1.3	475.	-0.6
400.	-1.8	350.	-1.7	390.	-1	400.	-0.1	450.	-2.6	400.	-1.1	450.	-0.8
450.	-1.0	400.	-1.7	460.	-0.2	450.	-2.6	500.	-4.5	450.	-1.3	475.	-0.6
500.	-2.0	450.	-2.3	500.	-3.1	450.	-2.6	500.	-4.5	450.	-1.3	475.	-0.6

DATE	720110	DATE	720114	DATE	720222	DATE	720317	DATE	720816	DATE	720821	DATE	721020	DATE	721200
HRVY	116	HRVY	117	HRVY	106	HRVY	107	HRVY	116	HRVY	117	HRVY	118	HRVY	119
TIME	1200	TIME	1400	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1000	TIME	1600
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0.	10.4	0.	10.8	0.	10.9	0.	10.6	0.	10.8	0.	10.3	0.	10.5	0.	10.7
40.	8.8	10.	9.0	10.	9.5	25.	8.7	50.	8.8	25.	8.9	50.	8.8	50.	8.6
100.	8.0	50.	8.4	50.	8.7	50.	8.8	100.	8.0	50.	8.7	100.	8.2	100.	7.7
140.	7.7	100.	8.1	100.	8.0	100.	7.9	150.	7.5	100.	7.4	150.	7.6	150.	6.4
200.	7.3	150.	7.6	150.	7.2	150.	7.2	200.	7.1	150.	7.1	200.	6.1	170.	6.7
250.	5.3	180.	5.4	200.	6.3	180.	6.7	250.	5.2	200.	6.8	250.	6.6	200.	5.6
300.	2.8	200.	2.0	250.	4.1	200.	4.5	300.	1.4	250.	5.3	300.	2.4	250.	2.7
350.	.4	250.	.6	300.	1.7	250.	3.1	350.	.1	250.	4.5	350.	.7	300.	.9
400.	+1.0	300.	2.0	350.	0.6	300.	1.2	300.	+1.6	300.	2.3	300.	+1.1	350.	+0.6
475.	+1.8	350.	.3	400.	+1.4	350.	+0.3	350.	+1.0	350.	.4	420.	+1.0	375.	+1.1
	+0.7		+1.4			375.	+1.0			400.	.9			430.	+2.1
	+0.5		+2.4												

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DATE	730103	DATE	730116	DATE	730316	DATE	730329	DATE	730405	DATE	730418	DATE	730429	DATE	730618
HRVY	114	HRVY	115	HRVY	116	HRVY	117	HRVY	118	HRVY	119	HRVY	119	HRVY	119
TIME	1600	TIME	1000	TIME	1400	TIME	800	TIME	1300	TIME	1200	TIME	1200	TIME	1200
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0.	10.7	0.	10.3	0.	10.4	17.	9.2	0.	11.0	0.	11.1				
40.	8.8	50.	8.8	40.	8.8	50.	8.8	17.	9.2	18.	9.1				
100.	8.1	100.	8.5	100.	7.9	100.	8.2	50.	8.6	50.	8.6				
134.	7.4	150.	6.7	150.	6.6	150.	7.2	100.	3.0	100.	8.1				
150.	7.4	200.	6.3	200.	5.6	200.	5.4	150.	7.2	150.	7.2				
200.	5.2	250.	2.2	225.	3.6	250.	2.8	160.	7.0	160.	7.1				
250.	7.4	300.	.6	250.	4.1	300.	.9	200.	4.5	200.	4.7				
300.	.1	350.	-0.8	320.	-0.3	350.	+0.7	250.	1.8	250.	2.5				
350.	+0.5	400.	+2.0	350.	+1.3	400.	+1.6	300.	.8	300.	.7				
475.	+1.6			400.	+1.9	310.	+2.0	330.	+1.3	350.	.7				
								400.	+2.2	400.	+2.3				

DATE 621024	DATE 621101	DATE 621109	DATE 621212	DATE 630109	DATE 630116	DATE 630122	DATE 630130
BRVY 1	BRVY 2	BRVY 3	BRVY 4	BRVY 5	BRVY 6	BRVY 7	BRVY 8
TIME 1200							
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54. 10.7	71. 10.7	30. 10.0	65. 10.1	11. 10.8	11. 10.8	277. 5.9	11. 10.6
60. 10.5	43. 10.8	72. 10.5	121. 9.9	9. 10.6	24. 9.9	300. 5.3	25. 10.0
117. 9.7	180. 9.6	118. 10.1	172. 8.7	24. 10.0	64. 11.2	346. 3.0	43. 11.1
234. 7.6	203. 8.2	164. 9.0	224. 7.7	60. 11.8	68. 10.5	401. 1.9	50. 10.8
240. 6.6	244. 7.9	213. 8.0	274. 5.6	89. 10.9	96. 10.3	435. 0.1	75. 10.5
326. 6.3	310. 6.8	270. 7.3	335. 2.2	72. 10.6	106. 10.5	451. 0.7	100. 10.1
374. 2.9	363. 3.2	3P1. 8.2	406. 1.3	94. 10.0	115. 10.4	479. 0.2	150. 9.2
425. -2	801. 1.0	368. 2.0	408. -2.6	108. 10.5	120. 9.8	200. 8.0	225. 7.5
521. -2.2	483. -1.4	349. 2.1	345. -2.1	114. 10.3	150. 9.3	275. 8.8	300. 8.5
		823. -1.5	619. -3.6	123. 9.6	176. 8.8		
		819. -2.8		150. 9.4	200. 8.2		
				174. 8.9	225. 7.5		
				104. 8.1	252. 6.6		
				225. 7.7	280. 5.5		
				250. 6.7	348. 2.9		
				279. 5.9	401. 1.9		
				300. 5.0	442. 1.1		
				350. 8.9	475. 0.3		
				400. -4	501. 0.6		
				450. -2	585. -1.2		
				476. -1.0			
				500. -1.5			

DATE 630205	DATE 630213	DATE 630221	DATE 630227	DATE 630307	DATE 630313	DATE 630321	DATE 630402
BRVY 9	BRVY 10	BRVY 11	BRVY 12	BRVY 13	BRVY 14	BRVY 15	BRVY 16
TIME 1200							
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09. 10.8	279. 9.4	-1. 10.6	174. 8.8	25. 10.0	83. 10.5	99. 10.1	200. 8.1
69. 10.0	300. 8.9	75. 10.0	224. 7.5	60. 11.1	25. 10.1	122. 9.5	225. 7.7
120. 9.7	350. 2.0	50. 10.7	250. 7.0	58. 10.6	30. 10.6	150. 9.2	250. 6.7
151. 9.0	376. 2.1	100. 10.1	275. 6.0	100. 10.0	100. 10.1	200. 8.0	300. 5.6
175. 8.8	400. 1.1	140. 8.3	300. 6.7	130. 6.5	100. 6.2	220. 7.5	350. 3.5
200. 7.9	424. 0.6	200. 6.2	320. 6.3	150. 6.0	173. 6.8	250. 6.5	375. 2.1
230. 6.6	431. -0.6	225. 7.8	350. 2.0	174. 5.8	201. 6.0	275. 5.6	400. 1.1
270. 5.6	477. -0.1	250. 6.0	375. 1.6	200. 8.2	225. 7.4	301. 6.3	451. 0.1
300. 6.8	299. 5.5	400. 1.0	220. 7.0	250. 6.6	323. 4.3	380. -1.3	
350. 3.3	350. 3.1	425. 1.5	250. 6.8	276. 5.0	349. 2.9		
375. 2.0	400. 1.3	451. -0.2	281. 5.7	301. 5.0	374. 2.1		
400. 1.0	450. -0.1	500. -1.7	301. 6.0	350. 2.8	400. 1.1		
425. -3	500. -1.0		351. 3.1	401. 1.8	425. 0.3		
451. -2.8			400. 1.8	451. 0.5	450. 0.4		
476. -2.0			451. 0.5	478. 0.1			
			477. -1.1				

DATE 630523	DATE 630611	DATE 630626	DATE 630712	DATE 630726	DATE 630807	DATE 630823	DATE 630909
BRVT 17	BRVT 18	BRVT 19	BRVT 20	BRVT 21	BRVT 22	BRVT 23	BRVT 24
TIME 1200							
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87.	10.1	81.	10.5	26.	10.1	81.	10.5
103.	9.9	28.	10.1	50.	10.5	25.	10.2
150.	9.0	50.	10.6	160.	10.1	49.	10.6
201.	7.9	75.	10.6	141.	9.0	100.	10.3
225.	7.3	100.	10.1	201.	8.0	149.	9.1
251.	6.2	150.	9.0	225.	7.0	201.	8.1
270.	5.9	173.	8.4	241.	6.5	225.	6.9
301.	5.6	200.	8.2	301.	6.8	250.	6.5
325.	5.4	225.	7.6	327.	5.6	200.	6.8
350.	3.7	251.	6.7	352.	5.6	225.	6.3
375.	2.8	270.	6.2	375.	4.0	250.	5.7
400.	1.3	300.	5.1	401.	1.9	325.	5.3
451.	-1.2	324.	4.1	426.	-1.9	350.	4.9
471.	-0.2	351.	3.4	451.	-0.2	400.	1.6
501.	-0.8	375.	2.1	476.	-0.5	425.	1.2
526.	-1.5	401.	1.6	500.	-1.1	450.	0.8
		425.	-0.8			475.	0.0
		451.	-0.6			501.	-0.6

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DATE 630923	DATE 631009	DATE 631028	DATE 631116	DATE 631231	DATE 640117	DATE 640214	DATE 640312
BRVT 25	BRVT 26	BRVT 27	BRVT 28	BRVT 29	BRVT 30	BRVT 31	BRVT 32
TIME 1200							
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90.	10.4	81.	10.5	151.	8.4	81.	10.6
74.	10.3	85.	10.3	201.	7.4	90.	10.4
101.	9.6	50.	10.4	241.	6.2	78.	9.9
120.	9.4	101.	9.4	302.	4.2	102.	9.3
151.	8.7	128.	9.0	343.	2.1	126.	9.0
170.	7.9	152.	8.0	402.	-1.7	151.	8.4
220.	6.7	175.	7.7	428.	-1.2	201.	6.7
252.	5.9	201.	6.7	458.	-0.5	232.	5.8
275.	4.5	226.	6.2	479.	-0.6	278.	4.3
303.	4.2	252.	5.2	500.	-0.9	302.	3.1
328.	3.0	302.	0.7	328.	1.8	277.	5.9
343.	3.2	327.	3.8	353.	1.0	302.	5.2
377.	2.3	352.	2.4	403.	0.6	353.	4.4
403.	1.7	377.	1.3	429.	-0.7	403.	3.2
454.	0.8	401.	0.0	453.	-0.10	453.	1.5
470.	-0.7	428.	0.0			504.	-0.3
		454.	-0.5			534.	-0.7
		479.	-0.6			565.	-1.7
						605.	-2.7
						685.	-3.1
						680.	-3.1

DATE 680420	DATE 680527	DATE 680624	DATE 680631	DATE 680725	DATE 681203	DATE 680120	DATE 680425
BRVY 33	BRVY 38	BRVY 39	BRVY 34	BRVY 37	BRVY 38	BRVY 39	BRVY 40
TIME 1200							
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50. 10.8	-1. 10.5	0. 10.8	0. 10.8	50. 10.2	0. 10.8	50. 10.1	0. 10.8
100. 10.0	50. 10.5	50. 10.8	50. 10.5	101. 9.9	50. 10.8	100. 9.9	50. 10.5
151. 9.6	101. 10.4	100. 10.2	101. 9.3	152. 9.0	101. 10.0	151. 8.9	100. 10.1
201. 7.9	151. 9.1	151. 9.1	151. 9.1	202. 8.6	151. 9.8	201. 9.7	151. 9.6
252. 7.0	201. 8.6	201. 8.6	201. 8.3	252. 8.9	202. 8.8	252. 7.4	201. 8.9
303. 5.9	252. 7.6	252. 7.6	252. 7.1	302. 9.0	252. 7.0	302. 5.7	251. 7.1
353. 4.7	302. 6.6	302. 6.6	302. 6.1	352. 3.3	302. 5.7	352. 4.0	303. 6.1
403. 3.6	352. 5.4	352. 5.4	352. 5.0	403. 1.9	352. 5.3	403. 2.9	352. 5.6
454. 1.7	403. 4.6	403. 5.6	403. 4.9	453. 1.7	403. 2.6	453. 1.8	403. 2.9
504. 0.0	453. 2.7	453. 3.4	453. 1.6	503. 1.1	453. .6	504. .0	453. .8
555. -1.1	503. -.2	503. -.1	503. -.1	503. -.5	503. -.5	504. -.4	504. -.5
606. -2.3	553. -1.6	553. -1.1	553. -1.5	605. -2.6	553. -2.6	605. -2.0	553. -2.3
655. -3.7	603. -2.6	603. -2.6	603. -2.6	655. -3.0	603. -3.0	655. -2.6	603. -2.6

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DATE 680700	DATE 681029	DATE 681220	DATE 680135	DATE 680329	DATE 680626	DATE 681103	DATE 670118
BRVY 31	BRVY 42	BRVY 43	BRVY 43	BRVY 45	BRVY 46	BRVY 49	BRVY 48
TIME 1200							
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50. 10.5	94. 9.6	0. 10.5	0. 9.7	0. 9.7	0. 9.7	50. 10.5	0. 10.6
101. 10.0	150. 9.1	50. 10.1	50. 10.5	50. 10.5	50. 10.7	100. 10.3	50. 10.5
151. 9.6	200. 8.6	101. 9.6	100. 10.6	100. 10.6	101. 10.3	150. 9.7	100. 10.3
201. 8.9	251. 7.1	151. 9.1	151. 9.8	151. 9.8	151. 9.8	201. 8.6	151. 9.8
251. 7.3	301. 6.2	201. 7.3	201. 9.6	201. 9.4	201. 9.5	277. 7.3	201. 7.6
303. 6.0	351. 5.6	251. 6.5	251. 7.0	251. 7.4	251. 7.5	302. 6.3	202. 7.8
353. 5.0	352. 5.6	302. 6.6	302. 7.0	301. 7.5	302. 7.8	330. 8.9	332. 8.3
403. 3.7	402. .8	351. 6.3	352. 7.3	352. 8.7	352. 8.6	402. 1.7	402. 8.6
454. 2.5	453. 0.0	351. 1.9	402. 1.7	374. 3.2	402. 2.0	452. .8	453. .8
504. 0.0	503. -1.6	402. -.2	452. .6	462. 2.0	462. .7	503. -1.0	503. -1.7
555. -1.0	553. -2.6	452. -.7	503. -.4	427. 1.6	502. -.2	553. -1.4	
606. -2.3	503. -2.6	503. -2.6	503. -2.6	478. -.1			
655. -3.7	553. -2.6	603. -2.6	603. -2.6	503. -.1			

DATE 670503	DATE 670915	DATE 670916	DATE 671213	DATE 680115	DATE 680120	DATE 680130	DATE 680208						
BRVY 69	BRVY 59	BRVY 51	BRVY 52	BRVY 53	BRVY 54	BRVY 55	BRVY 56						
TIME 1200													
-----	-----	-----	-----	-----	-----	-----	-----						
0.	10.8	50.	6.6	0.	11.6	0.	10.8	0.	10.8	0.	10.8	0.	10.8
40.	10.5	150.	8.8	50.	10.4	50.	10.5	50.	11.2	50.	10.7	50.	10.7
100.	9.9	200.	7.9	100.	11.0	100.	10.1	100.	10.1	100.	10.3	100.	10.2
140.	8.8	250.	6.9	140.	9.8	150.	9.8	140.	9.6	150.	9.5	140.	9.5
200.	7.9	300.	6.2	200.	7.2	200.	8.7	200.	8.7	200.	8.6	200.	8.6
300.	6.6	350.	5.7	250.	8.0	250.	7.9	230.	8.3	240.	8.4	250.	7.9
340.	5.0	400.	4.2	340.	7.6	290.	7.1	250.	7.0	301.	4.6	301.	3.2
380.	4.5	450.	3.5	401.	2.2	351.	3.6	350.	3.1	350.	4.1	350.	2.9
400.	3.4	500.	2.1	451.	1.6	401.	1.9	400.	1.6	401.	1.2	400.	1.0
450.	1.5	550.	1.3	450.	0.0	450.	0.0	450.	0.0	450.	0.7	450.	0.0
500.	0.8	500.	0.0	500.	-1.2	499.	-1.4	500.	-1.1	500.	0.7	499.	-1.7
550.	0.5	550.	0.0	550.	-2.0	549.	-1.9	550.	-0.9	550.	-2.7	550.	-2.7
600.	0.1	600.	0.0	600.	-2.1	600.	-2.1	600.	-2.1	600.	-2.1	600.	-2.1
620.	-0.2	620.	0.0	620.	-0.9	620.	-0.9	620.	-0.9	620.	-0.9	620.	-0.9

DATE 680215	DATE 680221	DATE 680226	DATE 680307	DATE 680313	DATE 680322	DATE 681007	DATE 681025						
BRVY 57	BRVY 58	BRVY 59	BRVY 60	BRVY 61	BRVY 62	BRVY 63	BRVY 64						
TIME 1200													
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-1.	10.8	-1.	10.8	0.	10.8	0.	10.8	0.	10.8	0.	10.8	0.	10.8
40.	10.8	50.	10.8	50.	10.9	50.	10.9	100.	10.1	100.	10.3	50.	10.4
100.	10.1	100.	10.1	100.	10.1	100.	10.1	150.	9.5	150.	9.5	100.	10.2
140.	9.4	150.	8.6	140.	9.3	150.	9.5	200.	8.7	200.	8.8	190.	9.3
200.	8.4	200.	8.6	200.	8.7	250.	7.5	250.	8.0	250.	7.6	200.	8.3
250.	7.9	250.	7.7	250.	7.7	300.	5.0	300.	5.4	300.	6.3	250.	7.5
300.	5.2	300.	5.5	300.	5.8	300.	5.1	350.	2.9	331.	4.3	325.	6.4
350.	3.2	351.	3.3	350.	3.0	350.	3.5	400.	0.9	350.	3.1	350.	3.3
400.	1.1	400.	1.2	400.	0.9	400.	1.1	450.	-0.9	401.	1.0	400.	1.0
450.	-0.1	450.	-0.1	450.	-0.5	450.	-0.2	500.	-0.9	449.	-1	450.	-0.4
500.	-0.2	500.	-0.1	499.	-0.4	500.	-0.2	550.	-0.8	500.	-0.6	500.	-0.7
550.	-0.2	550.	-0.0	550.	-0.9	550.	-0.8	584.	-0.8	550.	-0.1	575.	-0.1
600.	-0.3	600.	-0.0	600.	-0.9	600.	-0.8	620.	-0.8	600.	-0.1	600.	-0.1

DATE 681113	DATE 681220	DATE 690113	DATE 690122	DATE 690120	DATE 690205	DATE 690212	DATE 690210
BRVV 65	BRVV 66	BRVV 67	BRVV 68	BRVV 69	BRVV 70	BRVV 71	BRVV 72
TIME 1200							
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0, 10.7	0, 10.3	0, 10.6	0, 10.7	0, 10.7	0, 10.7	0, 10.7	0, 10.7
50, 10.4	50, 10.1	50, 10.4	50, 10.5	50, 10.4	50, 10.4	50, 10.5	50, 10.5
100, 10.1	100, 10.0	100, 10.0	100, 10.0	100, 10.0	100, 10.1	100, 10.1	100, 10.1
150, 9.8	150, 9.8	150, 9.8	150, 9.8	150, 9.8	150, 9.8	150, 9.8	150, 9.8
200, 9.6	200, 9.6	200, 9.6	200, 9.6	200, 9.6	200, 9.6	200, 9.6	200, 9.6
250, 7.8	250, 7.8	250, 7.8	250, 7.8	250, 7.8	250, 7.8	250, 7.8	250, 7.8
300, 6.7	300, 6.7	300, 6.7	300, 6.7	300, 6.7	300, 6.7	300, 6.7	300, 6.7
350, 2.7	350, 2.7	350, 2.7	350, 2.7	350, 2.7	350, 2.7	350, 2.7	350, 2.7
400, 1.8	400, 1.8	400, 1.8	400, 1.8	400, 1.8	400, 1.8	400, 1.8	400, 1.8
450, -1.1	450, -1.0	450, -1.0	450, -1.0	450, -1.1	450, -1.2	450, -1.2	450, -1.2
500, -1.8	500, -1.7	500, -1.6	500, -1.5	500, -1.4	500, -1.3	500, -1.2	500, -1.1
550, -3.8	550, -2.7	550, -1.7	550, -0.7	550, -0.1	550, -2.5	550, -2.2	550, -2.2
600, -3.8		550, -3.8	550, -3.8	600, -3.1	550, -3.8	550, -2.7	550, -2.7
					600, -3.8	550, -3.8	550, -3.8
					625, -0.3		

DATE 690226	DATE 690305	DATE 690312	DATE 690319	DATE 690507	DATE 690603	DATE 691023	DATE 691120
BRVV 73	BRVV 70	BRVV 73	BRVV 74	BRVV 77	BRVV 78	BRVV 79	BRVV 80
TIME 1200							
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0, 10.7	0, 10.7	0, 10.7	0, 10.6	50, 10.3	0, 10.7	50, 10.7	50, 10.7
50, 10.6	50, 10.7	50, 10.6	50, 10.7	100, 11.1	50, 10.6	100, 10.2	100, 10.2
100, 10.6	100, 10.0	100, 9.9	100, 9.9	150, 9.2	100, 10.2	150, 7.2	150, 9.3
150, 9.5	150, 9.6	150, 9.5	150, 9.6	200, 8.9	150, 9.4	200, 8.6	200, 8.9
200, 9.0	200, 8.9	200, 8.9	200, 8.9	250, 8.3	200, 8.6	250, 7.6	220, 8.6
250, 7.5	250, 7.9	250, 7.5	250, 7.8	300, 6.9	250, 8.1	270, 7.3	250, 7.5
300, 5.5	300, 5.6	300, 5.5	300, 5.6	350, 5.8	300, 6.6	290, 4.6	300, 4.6
350, 4.7	320, 4.1	350, 4.2	330, 4.8	400, 4.8	350, 3.8	350, 1.9	350, 2.1
390, 3.5	350, 4.2	380, 4.2	350, 4.3	450, 4.3	400, 1.8	400, 1.3	400, 1.3
400, 1.8	400, 2.7	400, 2.1	400, 1.7	500, 1.0	450, 0.3	450, 1.1	450, -1.0
450, -1.2	450, -0.7	500, -1.7	450, -1.7	550, -0.1	500, -2.0	500, -2.1	490, -1.9
500, -1.1	500, -1.4	550, -2.8	500, -1.8	600, -1.8	550, -3.2	550, -2.3	550, -2.3
550, -1.7	550, -2.1		550, -2.5		600, -1.6	550, -2.1	550, -2.1
600, -1.7					625, -0.8	550, -2.8	
650, -0.3							
700, -4.3							

DATE	T00210	DATE	T00210	DATE	T00210	DATE	T00210	DATE	T00210	DATE	T00210	DATE	T00210
TIME	0000	TIME	1800	TIME	1200	TIME	1200	TIME	1800	TIME	1200	TIME	1200
0.	10.5	50.	10.6	50.	10.6	50.	10.3	50.	10.3	50.	10.7	50.	10.3
10.	10.3	100.	10.0	100.	10.5	100.	10.4	100.	10.6	100.	10.8	100.	10.8
20.	9.4	150.	9.5	150.	9.6	150.	9.4	150.	9.5	150.	9.5	150.	9.3
30.	9.1	200.	9.0	200.	9.2	200.	9.0	200.	9.1	200.	9.1	200.	9.0
40.	8.8	220.	8.9	220.	8.8	217.	8.0	221.	8.0	221.	9.0	200.	9.0
50.	8.8	250.	8.7	250.	7.1	250.	6.8	250.	6.6	250.	6.7	235.	8.7
60.	8.2	250.	8.3	300.	8.6	300.	8.3	300.	8.8	300.	8.8	250.	8.0
70.	7.8	350.	7.8	350.	8.1	350.	7.8	350.	8.1	350.	8.5	350.	8.3
80.	7.5	400.	7.5	400.	7.7	400.	7.6	400.	7.1	400.	8.2	300.	8.3
90.	7.8	450.	7.1	450.	7.9	450.	7.2	450.	7.4	450.	7.3	350.	7.3
100.	7.6	500.	7.3	500.	7.8	500.	7.3	500.	7.3	500.	7.6	500.	7.0
110.	7.8	550.	7.3	550.	7.8	550.	7.0	550.	7.0	550.	7.0	500.	7.0
120.	7.8	550.	7.3	550.	7.8	550.	7.0	550.	7.0	550.	7.0	550.	7.0

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DATE	T00310	DATE	T01010	DATE	T01100	DATE	T01200								
TIME	1200	TIME	1800	TIME	1200	TIME	1200	TIME	1800	TIME	1200	TIME	1200	TIME	1200
0.	10.7	50.	10.4	0.	10.7	0.	10.7	50.	10.7	50.	10.1	0.	10.7	0.	10.6
50.	10.4	100.	10.3	50.	10.4	50.	10.3	50.	10.1	100.	10.0	50.	10.6	50.	10.6
100.	10.3	150.	9.3	100.	10.3	100.	12.2	100.	10.1	150.	9.3	100.	10.3	100.	10.1
150.	9.5	200.	9.0	140.	9.3	150.	7.8	150.	9.2	200.	9.0	150.	9.5	150.	9.2
200.	9.1	220.	8.7	200.	9.0	200.	8.9	200.	8.9	250.	7.4	200.	9.0	200.	8.9
250.	8.8	250.	6.6	220.	8.7	220.	8.7	250.	9.9	300.	8.6	250.	9.9	250.	7.6
300.	8.6	270.	9.9	290.	8.5	250.	8.6	300.	8.6	320.	8.6	300.	8.6	300.	8.6
350.	8.7	300.	8.7	300.	8.7	500.	8.5	310.	8.4	350.	8.2	310.	8.6	350.	8.0
400.	8.2	350.	8.3	350.	8.5	350.	8.4	350.	8.9	400.	8.0	350.	8.6	400.	8.0
450.	8.1	400.	8.6	400.	8.6	500.	8.3	400.	8.7	450.	8.0	400.	8.3	450.	8.4
500.	8.1	450.	8.8	450.	8.7	400.	8.1	450.	8.2	500.	8.1	450.	8.8	500.	8.1
550.	8.1	500.	8.4	500.	8.1	450.	8.0	480.	8.1	550.	8.0	500.	8.0	500.	8.0
600.	8.0	550.	8.3	550.	8.3	480.	8.7	500.	8.0	600.	8.8	580.	8.8	580.	8.8

DATE	T0121B	DATE	T1011B	DATE	T1020B	DATE	T1031B	DATE	T1041B	DATE	T1060B	DATE	T1081B	DATE	T1100B
SHVV	97	SHVV	98	SHVV	99	SHVV	100	SHVV	101	SHVV	102	SHVV	103	SHVV	104
TIME	1200														
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0.	10.7	1.	10.7	50.	10.7	50.	10.5	0.	10.7	50.	10.0	50.	10.1	50.	10.3
50.	10.7	1.	10.7	100.	10.1	100.	10.0	50.	10.1	100.	10.2	100.	10.1	100.	10.2
100.	10.4	1.	10.1	150.	9.3	150.	9.2	100.	10.5	150.	9.4	150.	9.2	150.	9.3
150.	9.4	1.	9.2	200.	8.9	200.	8.9	150.	9.2	200.	8.8	200.	8.8	200.	8.9
200.	9.1	1.	8.7	250.	8.0	250.	8.0	200.	8.8	250.	8.3	250.	8.1	250.	8.6
250.	8.3	1.	7.3	300.	6.6	300.	6.3	250.	8.2	300.	7.0	300.	7.2	300.	8.2
300.	6.9	1.	5.7	350.	4.3	350.	4.1	280.	8.2	350.	5.8	350.	6.6	350.	5.5
350.	8.5	1.	3.1	400.	1.6	330.	5.3	300.	7.2	380.	4.4	400.	1.7	350.	3.4
400.	4.0	1.	1.3	450.	-0.1	350.	6.3	350.	6.2	400.	2.4	450.	0.8	400.	1.6
450.	8.2	1.	0.1	500.	-1.1	400.	2.0	400.	3.7	450.	-0.7	500.	-0.3	450.	-0.9
500.	-0.9	1.	-0.1	550.	-0.9	450.	-0.4	450.	-2.0	500.	-2.0	500.	-2.0	500.	-0.8
550.	-0.6	1.	-0.2	600.	-1.2	500.	-1.2	450.	-2.0	550.	-2.0	550.	-2.0	550.	-0.8
600.	-0.2	1.	-0.7	650.	-2.2	550.	-2.2	500.	-3.0	600.	-3.0	650.	-2.3	650.	-2.3

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DATE	T1121B	DATE	T2011B	DATE	T2021B	DATE	T2022B	DATE	T2061B	DATE	T2062B	DATE	T2102B	DATE	T2120B
SHVV	105	SHVV	106	SHVV	107	SHVV	108	SHVV	110	SHVV	111	SHVV	112	SHVV	113
TIME	1200														
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50.	10.7	1.	10.5	50.	10.5	50.	10.6	50.	10.6	50.	10.4	50.	10.5	50.	10.6
100.	10.2	1.	10.2	100.	10.6	100.	10.1	100.	10.1	100.	10.4	100.	10.7	90.	10.7
150.	9.1	1.	9.7	150.	9.2	150.	9.0	150.	9.1	150.	9.1	150.	9.2	150.	10.6
200.	8.7	1.	8.9	200.	8.0	200.	8.8	200.	8.0	200.	8.7	200.	8.9	150.	9.0
250.	8.9	1.	8.9	250.	8.3	220.	8.5	220.	8.8	250.	7.8	250.	7.9	200.	8.6
280.	6.2	1.	6.4	300.	6.8	230.	6.9	250.	6.4	300.	7.1	300.	5.2	230.	7.3
300.	6.7	1.	5.1	350.	4.6	300.	4.4	300.	4.8	310.	6.6	350.	3.2	300.	4.2
350.	3.4	1.	1.0	400.	-0.7	350.	2.5	330.	3.5	350.	2.6	400.	1.4	350.	1.6
400.	1.0	1.	-0.5	450.	-0.8	400.	1.1	350.	3.0	400.	-1.1	450.	-0.5	400.	0.6
450.	-1.8	1.	-1.9	500.	-0.8	450.	-0.1	400.	-2.2	450.	-1.0	470.	-1.0	450.	-1.0
500.	-2.5	1.	-2.7	550.	-1.4	500.	-1.4	450.	-2.0	500.	-2.2	470.	-2.3	470.	-2.3

DATE	730105	DATE	730216	DATE	730316	DATE	730325	DATE	730405	DATE	730418
BRVT	114	BRVT	114	BRVT	116	BRVT	117	BRVT	118	BRVT	119
TIME	1100	TIME	1000	TIME	900	TIME	800	TIME	1300	TIME	1200
50.	10.9	50.	10.7	50.	10.8	50.	10.7	50.	10.9	50.	10.7
100.	10.8	100.	10.4	100.	10.3	100.	10.4	100.	10.8	100.	10.2
150.	9.0	150.	9.0	150.	9.0	150.	9.0	150.	8.9	150.	9.2
200.	8.8	200.	8.9	200.	8.9	200.	8.9	200.	8.9	200.	8.8
250.	8.9	223.	8.7	224.	8.8	230.	8.8	230.	8.7	250.	7.7
300.	7.3	250.	6.9	250.	6.9	250.	7.0	250.	7.0	300.	4.7
350.	8.6	300.	8.6	300.	8.9	300.	9.0	300.	8.8	348.	8.2
400.	7.5	350.	7.4	350.	7.3	350.	7.0	350.	7.1	350.	5.6
450.	6.2	400.	6.2	400.	6.0	400.	6.1	400.	5.5	400.	5.5
500.	6.2	450.	6.0	450.	6.5	450.	6.4	450.	6.4	450.	6.4
		495.	6.2	475.	6.0	500.	6.2	500.	6.0	475.	6.3

76

DATE	621024	DATE	621101	DATE	621109	DATE	621212	DATE	630109	DATE	630116	DATE	630122	DATE	630130
BRVT	1	BRVT	2	BRVT	3	BRVT	4	BRVT	5	BRVT	6	BRVT	7	BRVT	8
TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200
102.	9.0	-11.	10.7	134.	8.0	33.	10.4	-11.	10.5	89.	10.1	50.	10.1	0.	10.5
161.	7.4	14.	10.3	277.	7.6	82.	9.3	24.	10.2	100.	8.9	100.	9.1	50.	10.1
221.	6.1	41.	10.2	277.	6.4	131.	8.1	50.	10.1	150.	7.7	150.	7.7	100.	8.8
280.	5.8	69.	8.8	318.	6.6	188.	7.0	100.	8.9	200.	7.0	200.	7.0	124.	8.0
340.	6.3	110.	8.4	418.	7.3	236.	6.8	128.	8.0	225.	6.6	225.	6.6	150.	7.8
399.	1.7	231.	4.1	482.	-1.9	502.	4.5	150.	7.8	250.	6.0	251.	6.1	200.	6.9
455.	6.1	221.	5.7	539.	6.5	339.	2.0	178.	7.0	265.	6.0	266.	6.0	225.	6.8
514.	6.2	338.	6.1			433.	6.8	201.	6.8	300.	3.9	300.	4.0	275.	5.3
		342.	5.2			513.	6.1	225.	6.7	325.	2.9	325.	2.8	300.	4.3
		370.	1.0			567.	6.1	261.	5.8	351.	2.2	350.	1.4	350.	2.9
		633.	-0.1			614.	6.8	300.	3.2	400.	1.7	376.	1.5	400.	1.8
		886.	-0.1			674.	6.7	329.	4.1	450.	1.2	401.	1.3	425.	1.8
								378.	1.5	482.	0.0	431.	1.7	450.	0.4
								401.	1.0	501.	0.4	450.	1.2	500.	0.1
								428.	0.0	520.	-1.4	501.	0.0	520.	0.1
								531.	0.4	525.	-0.5				
								464.	0.0						
								588.	0.5						
								726.	-1.6						

DATE	630205	DATE	630213	DATE	630221	DATE	630227	DATE	630307	DATE	630313	DATE	630321	DATE	630408
BRVY	4	BRVY	10	BRVY	11	BRVY	12	BRVY	13	BRVY	14	BRVY	15	BRVY	16
TIME	1800	TIME	1800	TIME	1200	TIME	1200	TIME	1800	TIME	1200	TIME	1200	TIME	1800
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230.	5.0	161.	5.7	-12.	8.6	80.	7.3	205.	5.8	0.	8.6	176.	5.0	0.	8.0
275.	3.0	150.	6.8	204.	7.3	75.	4.8	225.	5.8	20.	7.2	225.	5.8	6.	8.5
301.	2.6	178.	5.8	40.	7.0	116.	6.8	451.	5.1	50.	6.8	290.	9.3	10.	7.9
325.	1.3	200.	5.7	90.	6.8	121.	7.5	277.	4.0	100.	6.6	274.	6.5	17.	7.7
600.	-.3	227.	5.9	123.	7.6	135.	7.6	300.	3.2	150.	6.8	301.	3.2	50.	8.8
451.	-.9	255.	5.1	131.	6.8	174.	4.8	325.	2.0	175.	4.8	326.	1.0	100.	8.6
		277.	4.2	192.	8.0	200.	5.8	340.	1.2	200.	5.6	351.	1.2	125.	7.5
		300.	3.7	150.	6.8	226.	5.4	401.	0.0	225.	5.8	400.	0.0	150.	7.0
		331.	1.0	174.	5.8	250.	5.1	450.	-.1	250.	5.1	424.	-.4	175.	5.0
		375.	-.7	261.	9.8	275.	4.0			275.	6.3	450.	-.6	226.	5.0
		401.	-.1	226.	5.8	300.	3.7			300.	3.1			250.	5.6
		431.	-.7	243.	5.1	331.	1.5			326.	1.6			275.	4.0
		451.	-.7	277.	3.9	400.	-.3			350.	1.3			301.	3.3
		301.	3.4	450.	-.9					400.	-.2			351.	1.4
		325.	8.5	476.	-.1					451.	-.1			401.	-.5
		350.	1.4											426.	0.0
		370.	1.2											451.	-.5
		394.	-.3											475.	-.1
		425.	-.2												
		450.	-.6												
		476.	-.1												

DATE	630523	DATE	630611	DATE	630626	DATE	630712	DATE	630724	DATE	630807	DATE	630823	DATE	630905
BRVY	17	BRVY	18	BRVY	19	BRVY	20	BRVY	21	BRVY	22	BRVY	23	BRVY	24
TIME	1200	TIME	1800	TIME	1200	TIME	1200	TIME	1800	TIME	1800	TIME	1200	TIME	1800
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-1.	8.5	0.	8.8	110.	6.0	-1.	9.0	-1.	8.0	0.	9.0	0.	9.0	120.	7.3
20.	7.3	20.	7.0	120.	7.6	25.	8.4	24.	7.6	25.	7.9	29.	7.0	151.	7.3
50.	6.6	24.	6.0	140.	7.1	50.	6.8	50.	6.9	50.	7.0	76.	6.6	174.	6.0
101.	6.7	48.	6.6	174.	6.0	101.	6.7	73.	6.5	75.	6.6	100.	6.8	201.	5.7
120.	7.0	100.	6.8	200.	5.8	126.	7.5	100.	6.6	100.	6.6	125.	7.3	228.	5.9
141.	6.7	111.	6.8	225.	5.8	153.	6.0	123.	7.5	124.	7.3	150.	7.2	251.	5.8
170.	5.7	119.	5.1	231.	5.8	174.	5.8	141.	7.3	151.	6.8	175.	6.1	278.	5.8
225.	5.9	125.	7.1	276.	5.8	203.	5.9	176.	5.8	175.	5.8	201.	5.7	300.	6.0
250.	5.3	150.	6.4	300.	5.0	227.	5.0	201.	5.5	200.	5.5	223.	5.9	326.	5.8
310.	5.4	175.	5.4	351.	2.8	250.	5.4	225.	5.8	246.	5.0	250.	5.5		
320.	5.4	201.	5.5	396.	1.8	275.	5.5	241.	5.7	250.	5.8	274.	5.9		
350.	1.8	251.	5.8	476.	-.6	301.	6.7	274.	5.7	276.	5.6	302.	5.5		
374.	-.4	270.	5.7	451.	-.1	327.	2.8	301.	5.9	300.	6.8	350.	2.8		
401.	-.3	300.	3.0			350.	1.5	325.	5.4	320.	5.0	376.	-.8		
450.	-.8	329.	2.3			375.	-.3	351.	2.4	351.	3.8	426.	-.1		
		401.	-.6			401.	-.2	376.	1.4	375.	1.0	476.	-.7		
		451.	-.7			426.	-.9	401.	1.0	425.	-.4				
								425.	-.9	476.	-.5				
								450.	-.1						
								476.	-.7						

DATE 630025	DATE 631004	DATE 631028	DATE 631114	DATE 640117	DATE 640218	DATE 640312	DATE 640409
BRVY 25	BRVY 26	BRVY 27	BRVY 28	BRVY 30	BRVY 31	BRVY 32	BRVY 33
TIME 1200	TIME 1400	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200
www xxxxx	www xxxxx	www xxxxx	www xxxxx	www xxxxx	www xxxxx	www xxxxx	www xxxxx
25.	7.8	-101.	8.3	201.	8.8	-100.	8.2
30.	8.7	-77.	8.7	201.	8.3	-74.	8.2
73.	8.5	-51.	8.4	202.	8.0	-51.	8.3
100.	8.7	0.	8.9	202.	8.5	0.	8.8
186.	7.3	24.	7.4	202.	8.5	50.	7.9
191.	8.8	50.	8.4	202.	8.5	50.	8.6
170.	5.9	76.	6.4	202.	8.5	76.	6.3
201.	8.4	100.	8.8	202.	8.2	101.	8.1
227.	5.8	125.	7.9	202.	8.2	101.	8.1
277.	3.5	151.	6.7	227.	8.5	253.	6.6
302.	3.4	177.	5.8	251.	8.5	270.	5.9
327.	3.0	202.	6.4	277.	8.0	303.	7.5
370.	4.9	251.	6.1	302.	7.5	333.	7.3
403.	4.3	276.	6.4	227.	7.2	370.	6.9
429.	-1.8	102.	8.0	353.	-1.9	404.	-1.5
		327.	2.5	370.	-1.8	453.	-1.6
		153.	0.4			493.	-1.0
		377.	0.4			505.	-1.0
		803.	0.0			553.	-3.0
		827.	0.8				
		453.	-1.1				
		488.	-0.6				
		508.	-1.4				

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DATE 640527	DATE 640604	DATE 640631	DATE 640625	DATE 641203	DATE 650120	DATE 650428	DATE 650506
BRVY 34	BRVY 35	BRVY 36	BRVY 37	BRVY 38	BRVY 39	BRVY 40	BRVY 41
TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200
www xxxxx	www xxxxx	www xxxxx	www xxxxx	www xxxxx	www xxxxx	www xxxxx	www xxxxx
0.	6.8	0.	7.0	0.	7.0	-14.	8.0
30.	8.6	56.	7.3	40.	7.2	50.	7.3
160.	6.7	100.	6.8	100.	5.9	101.	7.1
161.	6.9	151.	6.8	151.	6.1	151.	7.0
201.	6.3	201.	6.1	201.	5.7	201.	5.9
252.	5.6	252.	5.7	252.	5.0	251.	5.5
302.	4.0	377.	5.0	371.	5.3	302.	5.7
337.	4.3	102.	6.4	333.	4.8	302.	5.6
353.	2.7	353.	2.5	353.	1.6	352.	1.6
403.	-1.7	803.	-1	403.	-5	402.	-8
453.	-1.9	828.	-1.6	453.	-1.1	453.	-1.0
503.	-2.1	503.	-1.5	503.	-1.3	503.	-1.3
		578.	-1.4	553.	-1.6	578.	-1.6
		504.	-1.5	503.	-1.8	504.	-1.8
		520.	-1.4	505.	-2.0	520.	-2.0
		505.	-2.0				

DATE 651020	DATE 651220	DATE 660124	DATE 660329	DATE 660426	DATE 661103	DATE 670110	DATE 670503
BRVY 82	BRVY 83	BRVY 84	BRVY 85	BRVY 86	BRVY 87	BRVY 88	BRVY 89
TIME 1200							
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-91.	8.7	-51.	8.7	50.	7.3	0.	8.2
0.	8.3	0.	8.0	100.	7.2	90.	7.5
50.	7.6	50.	7.1	150.	7.0	100.	7.0
100.	7.6	101.	7.3	201.	6.3	151.	6.7
151.	6.9	151.	6.9	251.	5.1	201.	6.7
201.	6.4	201.	6.0	251.	4.9	251.	6.4
251.	5.7	251.	5.7	301.	4.5	301.	6.0
301.	6.4	301.	6.1	351.	4.2	351.	5.9
351.	5.4	351.	5.8	377.	3.3	377.	5.2
377.	4.1	377.	4.8	383.	3.3	383.	4.7
383.	2.6	383.	4.7	402.	1.8	402.	1.9
402.	1.8	402.	2.0	427.	0.4	452.	0.7
427.	0.9	427.	0.8	452.	0.6	502.	0.5
452.	-0.1	452.	-0.1	503.	-0.5	502.	-1.7
503.	-0.5	503.	-3.1	528.	-1.0	552.	-2.1
528.	-1.4	528.	-1.9	578.	-2.0	603.	-3.4

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DATE 670915	DATE 670916	DATE 671213	DATE 680115	DATE 680126	DATE 680130	DATE 680208	DATE 680215
BRVY 50	BRVY 51	BRVY 52	BRVY 53	BRVY 54	BRVY 55	BRVY 56	BRVY 57
TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200
-----	-----	-----	-----	-----	-----	-----	-----
0.	8.1	0.	8.1	0.	7.8	99.	8.8
50.	7.1	50.	7.4	50.	7.5	300.	7.4
100.	6.7	100.	7.0	100.	6.7	300.	6.8
150.	6.8	150.	6.7	150.	6.9	150.	6.7
200.	6.9	200.	6.9	200.	7.2	200.	6.8
250.	6.9	250.	7.0	250.	7.4	250.	7.0
300.	5.4	300.	5.6	300.	6.5	300.	5.0
350.	5.0	350.	5.0	350.	5.3	350.	5.1
400.	4.0	400.	4.7	400.	5.0	300.	5.0
450.	3.1	450.	3.3	450.	3.9	400.	3.0
500.	-0.4	500.	-0.1	500.	-1.0	500.	-0.8
550.	-0.8	550.	-0.3	550.	-1.9	550.	-1.1
600.	-2.4	590.	0.0	590.	-0.6	600.	0.1
650.	-1.2	650.	-0.7	650.	-1.9	650.	-1.6
700.	-2.4	690.	-2.4	678.	-2.8	700.	-2.5
750.	-1.6	750.	-2.0	750.	-2.8	750.	-2.3

DATE 680271	DATE 680286	DATE 680307	DATE 680315	DATE 680322	DATE 681007	DATE 681025	DATE 681113
BRVV							
TIME 1200							
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-1.	0.1	-1.	0.2	0.	0.3	0.	0.0
50.	7.1	50.	7.1	50.	7.1	50.	7.1
100.	0.0	100.	0.0	100.	0.0	100.	0.0
150.	7.0	150.	6.9	150.	6.8	150.	6.7
200.	7.1	200.	7.0	200.	7.0	200.	7.0
250.	7.2	250.	7.1	250.	7.1	250.	7.0
300.	5.1	300.	5.1	300.	5.0	300.	5.0
350.	2.3	350.	1.9	350.	1.7	350.	1.6
399.	1.0	400.	0.9	400.	1.0	400.	1.0
400.	-1.3	400.	-1.3	400.	-1.4	400.	-1.4
400.	-1.2	500.	0.0	500.	0.0	500.	0.0
500.	-1.7	500.	-1.8	500.	-1.9	500.	-1.9
500.	0.0	500.	0.0	500.	-1.0	500.	-1.0
650.	-1.0	650.	-1.0	650.	-1.0	650.	-1.0
700.	-2.3	700.	-2.3	700.	-2.3	700.	-2.3

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DATE 681220	DATE 690113	DATE 690122	DATE 690129	DATE 690205	DATE 690212	DATE 690219	DATE 690226
BRVV							
TIME 1200							
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0.	8.1	0.	8.6	0.	8.5	0.	8.6
50.	6.9	50.	6.7	50.	6.7	50.	6.8
100.	0.8	100.	0.5	100.	0.8	100.	0.5
150.	7.3	150.	7.0	150.	7.0	150.	6.7
200.	7.7	200.	7.6	200.	7.6	200.	7.5
250.	6.9	250.	7.0	250.	7.3	250.	7.2
300.	5.1	300.	5.4	300.	5.1	300.	5.2
350.	4.7	350.	4.1	350.	3.3	350.	3.1
400.	2.8	400.	2.9	400.	2.0	400.	1.7
450.	1.0	450.	1.3	450.	0.9	450.	1.2
500.	-1.3	500.	-0.8	500.	-0.5	500.	-1.2
550.	-1.0	550.	-0.7	550.	-1.0	550.	-0.6
600.	-1.4	600.	-1.4	600.	-1.0	600.	-1.0
650.	-2.2	650.	-2.2	650.	-2.2	650.	-2.2
700.	-3.7	700.	-3.7	700.	-3.7	700.	-3.7

DATE 090305	DATE 090312	DATE 090319	DATE 090407	DATE 090413	DATE 091003	DATE 091100	DATE 091110
BRVY 76	BRVY 73	BRVY 76	BRVY 77	BRVY 78	BRVY 79	BRVY 80	BRVY 81
TIME 1800	TIME 1800	TIME 1200	TIME 1800	TIME 1800	TIME 1200	TIME 1800	TIME 1200
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0.	8.3	0.	8.3	0.	8.5	0.	8.4
50.	8.7	50.	8.2	50.	8.4	100.	8.4
100.	8.5	100.	8.0	100.	8.4	150.	8.7
150.	8.5	150.	8.7	150.	8.7	200.	8.2
200.	7.5	200.	7.4	200.	7.3	250.	7.3
250.	7.3	250.	7.0	250.	7.4	300.	7.0
300.	3.1	300.	4.7	300.	4.5	350.	4.3
350.	2.3	350.	3.7	350.	3.7	400.	3.1
400.	1.8	400.	2.5	400.	1.9	450.	2.9
450.	0.0	450.	0.6	450.	0.8	500.	1.6
500.	-1.4	500.	-2.4	500.	-2.2	500.	0.3
550.	-3.0					600.	1.0
600.	-3.3					650.	0.6
650.	-4.6					700.	-1.2
700.	-2.7					750.	-1.7
750.	-3.8					800.	-1.5
						850.	-0.6
						900.	-0.1
						950.	0.3
						1000.	-0.6

DATE	TIME														
84YY	62	84YY	83	84YY	88	84YY	85	84YY	66	84YY	87	84YY	88		
TIME	1200	TIME	1800	TIME	1200										
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40.	8.8	50.	8.6	70.	8.4	90.	8.3	50.	8.2	0.	7.3	50.	8.3	0.	6.6
100.	8.0	100.	8.0	100.	7.9	100.	7.9	100.	7.8	50.	8.0	100.	7.8	50.	8.2
150.	7.4	150.	7.4	150.	7.4	150.	7.6	150.	7.5	100.	8.0	150.	7.6	100.	7.9
200.	7.2	200.	7.1	200.	7.2	200.	7.3	200.	7.2	150.	7.8	200.	7.2	150.	7.6
250.	7.0	250.	7.3	250.	7.3	250.	7.2	250.	7.3	200.	7.3	250.	7.3	200.	7.2
300.	6.9	300.	5.6	250.	7.1	300.	6.4	250.	6.7	250.	7.3	250.	7.2	250.	7.3
350.	3.0	350.	4.5	240.	4.0	350.	2.5	300.	3.6	280.	7.1	300.	4.1	300.	4.6
400.	2.6	550.	3.4	300.	4.6	400.	1.1	350.	1.0	275.	5.4	350.	2.8	350.	2.7
450.	1.0	400.	1.6	340.	3.0	450.	0.1	400.	.6	300.	4.4	400.	.6	400.	1.3
500.	-0.4	450.	-0.1	400.	1.2	500.	-0.1	450.	-0.1	350.	2.3	450.	-1	450.	-0.2
550.	-0.2	400.	-1.9	450.	-0.4	550.	-0.7	500.	-1.1	400.	-0.7	500.	-1.1	500.	-0.7
600.	-0.7	470.	-3.6	500.	-1.6	600.	-2.7	550.	-2.7	450.	-0.5	550.	-3.2	500.	-0.7
650.	-	-	-	550.	-3.6	-	-	-	-	500.	-0.7	-	-	-	-

DATE	700313	DATE	700316	DATE	700318	DATE	700426	DATE	701015	DATE	701100	DATE	701209	DATE	701218
RRVV	90	RRVV	91	RRVV	92	RRVV	93	RRVV	94	RRVV	95	RRVV	96	RRVV	97
TIME	1200														
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50.	8.1	50.	8.7	50.	8.2	50.	8.9	50.	8.5	50.	8.7	50.	8.7	50.	7.2
100.	7.8	100.	7.9	100.	8.0	500.	8.2	50.	8.4	50.	8.4	50.	8.0	50.	8.6
150.	7.3	150.	7.7	150.	7.6	1000.	7.9	100.	8.6	100.	8.6	100.	9.2	80.	8.4
200.	7.1	200.	7.2	200.	7.1	1500.	7.4	150.	7.8	150.	7.7	150.	7.8	95.	8.7
250.	7.5	250.	7.7	250.	7.6	2000.	7.1	200.	7.1	200.	7.3	200.	7.1	100.	9.3
300.	6.8	300.	9.3	300.	8.2	2500.	7.0	250.	7.1	250.	7.4	250.	7.2	110.	8.8
350.	2.2	150.	2.4	350.	8.5	3000.	8.4	300.	8.3	267.	7.1	300.	8.4	150.	7.6
400.	1.7	400.	2.7	400.	1.0	342.	8.5	330.	8.7	300.	5.0	350.	3.1	200.	7.3
450.	1.2	422.	2.2	450.	0.8	350.	8.2	350.	5.2	380.	2.8	400.	1.9	350.	7.8
500.	0.18	450.	0.0	500.	-0.1	400.	7.6	400.	1.7	400.	1.7	450.	-0.1	250.	7.8
550.	-0.8	400.	0.2	550.	-0.8	450.	-0.5	450.	-0.4	450.	1.2	300.	-1.4	300.	4.8
600.	-0.8	538.	-0.6	600.	-0.8	480.	-2.6	500.	-1.7	500.	-0.7	400.	-1.6	350.	8.0
650.	-0.8	513.	-0.7	650.	-0.8	513.	-1.7	550.	-0.1	550.	-0.7	500.	-0.7	400.	1.6
700.	-0.8	550.	-1.8	700.	-0.8	550.	-1.8	500.	-0.8	500.	-0.8	450.	-0.8	450.	-1.2
750.	-0.8	500.	-0.8	750.	-0.8	500.	-0.8	500.	-0.8	500.	-0.8	400.	-0.8	400.	-0.8

DATE	T10113	DATE	T10209	DATE	T10311	DATE	T10412	DATE	T10487	DATE	T10816	DATE	T11004	DATE	T11213
BRVV	98	BRVT	99	BRVV	100	BRVT	101	BRVV	102	BRVT	103	BRVV	104	BRVT	105
TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
0.	7.3	0.	7.0	0.	7.4	0.	6.6	0.	6.6	0.	6.8	0.	6.5	0.	7.2
50.	8.3	50.	8.2	50.	7.8	50.	7.6	50.	8.2	50.	8.4	50.	8.2	50.	8.7
100.	8.9	100.	8.6	100.	9.1	100.	8.2	100.	8.3	100.	8.0	100.	8.4	100.	8.1
150.	7.3	150.	7.2	150.	7.4	150.	7.6	150.	7.4	150.	7.6	150.	8.1	150.	7.4
200.	7.2	200.	7.2	200.	7.3	200.	7.6	200.	7.3	200.	7.6	200.	7.3	200.	7.3
250.	7.3	250.	7.2	250.	7.3	250.	7.3	250.	7.7	250.	8.0	250.	7.4	250.	8.4
300.	9.0	300.	8.7	300.	8.7	300.	9.5	300.	5.5	300.	5.7	300.	8.8	300.	7.0
350.	8.5	350.	7.8	350.	8.2	350.	8.0	350.	8.0	350.	8.1	350.	8.5	350.	7.1
400.	8.7	400.	7.2	400.	8.6	400.	7.6	400.	8.4	400.	8.0	400.	8.5	400.	8.0
450.	3.9	450.	4.8	450.	1.8	450.	4.0	450.	1.3	450.	3.8	450.	1.5	450.	3.5
500.	1.2	500.	0.9	500.	0.0	500.	1.3	500.	2.0	500.	0.5	500.	0.9	500.	1.9
550.	-1.3	550.	0.1	550.	-1.3	550.	-1.6	550.	-0.4	550.	-0.6	550.	-2.3	550.	-1.3
575.	-8.8			550.	-1.8	550.	-1.0	550.	-1.4	600.	-1.6	450.	-1.3	550.	-1.0
				600.	-3.8	600.	-3.0	500.	-0.9	500.	-1.7	500.	-1.4	575.	-2.5
								600.	-3.6			575.	-2.5		

101

DATE	T20110	DATE	T20214	DATE	T20222	DATE	T20317	DATE	T20410	DATE	T20821	DATE	T21020	DATE	T21208
BRVV	106	BRVT	107	BRVV	108	BRVT	109	BRVV	110	BRVT	111	BRVV	112	BRVT	113
TIME	1200	TIME	1300	TIME	1100	TIME	1300								
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0.	7.4	0.	7.6	0.	7.1	0.	8.0	0.	7.4	0.	6.5	0.	7.7	0.	8.3
50.	8.6	50.	8.3	50.	8.0	50.	8.3	50.	8.0	25.	7.7	50.	7.5	50.	8.0
100.	8.0	100.	8.2	100.	7.9	100.	8.6	100.	8.4	50.	8.5	100.	8.2	100.	7.8
150.	7.3	150.	7.4	150.	7.2	150.	8.0	150.	7.3	100.	8.2	150.	7.3	150.	7.3
200.	7.1	200.	7.4	200.	7.2	200.	8.2	200.	7.1	150.	7.3	200.	7.4	200.	7.5
250.	0.4	250.	7.3	250.	7.6	250.	8.3	250.	7.3	200.	7.0	250.	7.6	250.	7.7
300.	0.9	300.	7.3	275.	7.2	275.	8.1	260.	7.0	250.	6.7	300.	7.0	260.	7.5
325.	6.9	350.	4.7	300.	5.8	300.	6.7	300.	4.7	300.	6.7	350.	3.6	300.	5.5
350.	5.6	400.	2.8	350.	3.6	350.	4.2	350.	2.0	350.	5.3	400.	1.1	350.	3.0
400.	3.0	450.	1.6	400.	2.2	400.	2.6	400.	1.4	375.	4.4	450.	-0.3	400.	1.3
450.	1.1	500.	0.1	450.	1.1	450.	1.3	410.	0.3	400.	1.6	500.	-0.6	450.	-0.1
500.	-0.3	550.	-0.4	500.	-0.4	500.	0.0	412.	1.7	429.	1.6	535.	-1.0	500.	-0.0
550.	-1.5	575.	-1.8	550.	-0.7	550.	-0.7	450.	1.4	450.	2.6			585.	-2.6
575.	-2.0	600.	-1.9	575.	-1.8			300.	-0.3	500.	2.3				
								300.	-0.3	500.	2.3				
								325.	-1.3	550.	-1.2				
								500.	-2.3	600.	-2.3				

DATE	730105	DATE	730216	DATE	730316	DATE	730325	DATE	730405	DATE	730416
BRVY	114	BRVY	114	BRVY	116	BRVY	117	BRVY	118	BRVY	119
TIME	1100	TIME	1100	TIME	1000	TIME	700	TIME	1800	TIME	1300
0.	8.2	0.	8.3	0.	8.0	0.	8.1	0.	8.0	0.	7.9
50.	8.8	50.	8.8	40.	8.2	50.	8.2	50.	8.1	50.	8.0
100.	8.1	100.	7.9	100.	7.9	100.	7.9	100.	7.9	100.	7.8
150.	7.4	150.	7.3	150.	7.3	150.	7.3	150.	7.3	150.	7.4
200.	7.7	200.	7.7	200.	7.5	190.	7.7	180.	7.6	145.	8.0
250.	7.8	222.	7.9	225.	7.8	250.	7.4	400.	6.8	250.	3.9
300.	4.5	224.	7.7	250.	5.7	100.	8.0	250.	3.6	300.	2.8
350.	2.6	250.	8.5	300.	3.0	317.	-1.2	300.	1.5	350.	2.1
400.	1.5	300.	2.4	340.	1.0	340.	-1.8	350.	1.2	400.	1.3
450.	-1.4	350.	1.4	400.	-2.1	350.	-1.6	400.	-1.7	450.	-1.8
500.	-1.2	400.	-1.3	450.	-1.9	400.	-1.3	450.	-0.4	500.	-1.8
550.	-1.4	450.	-1.4	500.	-2.1	450.	-1.7	500.	-0.9	550.	-2.8
500.	-1.0			500.	-1.0	500.	-1.0	500.	-3.3		

DATE	621024	DATE	621101	DATE	621109	DATE	621212	DATE	630109	DATE	630116	DATE	630122	DATE	630130
BRVY	1	BRVY	2	BRVY	3	BRVY	4	BRVY	5	BRVY	6	BRVY	7	BRVY	8
TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200	TIME	1200
53.	7.3	16.	8.0	17.	8.0	9.	7.7	-1.	8.6	81.	7.3	20.	7.6	0.	8.8
46.	6.4	62.	6.4	66.	6.3	67.	6.9	21.	7.3	50.	7.0	29.	8.0	15.	7.7
13d.	6.2	158.	9.1	166.	5.3	121.	7.3	29.	7.8	99.	8.8	50.	7.0	20.	7.3
801.	4.8	166.	4.7	237.	5.4	159.	6.4	50.	7.1	126.	7.1	49.	6.8	30.	7.0
236.	5.2	219.	4.7	295.	3.3	201.	4.9	86.	6.9	136.	7.3	124.	7.3	100.	6.8
283.	5.8	270.	5.3	349.	1.4	273.	2.6	128.	7.6	173.	5.6	132.	6.9	120.	7.4
337.	6.2	331.	6.6	464.	-1.8	358.	-2	150.	6.8	191.	5.6	151.	6.5	123.	7.6
378.	2.1	371.	1.7	511.	-8.0	378.	1.1	190.	5.5	208.	5.8	176.	5.7	131.	8.4
421.	-1	424.	-1.7			430.	-0.6	201.	5.9	227.	5.9	193.	5.9	141.	8.1
436.	-1.6	486.	-1.3			479.	-3.6	226.	6.1	251.	6.0	227.	6.8	147.	6.5
365.	-2.1	931.	-2.0					291.	3.6	275.	2.9	251.	6.6	173.	5.9
								301.	1.1	301.	2.4	297.	2.3	190.	5.5
								350.	-1	326.	1.2	350.	-0.8	200.	5.7
								375.	-1.3	350.	-0.8	376.	-1.0	226.	6.0
										376.	-1.0			252.	6.0
														259.	5.2
														271.	3.7
														300.	2.5
														328.	2.4
														329.	1.8
														358.	1.9
														401.	0.8
														431.	0.0

DATE 630205	DATE 630213	DATE 630221	DATE 630227	DATE 630307	DATE 630313	DATE 630321	DATE 630402
BHVV 9	BRVV 10	BRVV 11	BRVV 12	BRVV 13	BRVV 14	BRVV 15	BRVV 16
TIME 1800							
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09. 10.2	276. 5.3	11. 10.5	78. 6.0	275. 5.5	11. 10.5	100. 8.9	11. 10.5
100. 8.9	100. 8.7	49. 10.1	100. 8.8	300. 5.0	49. 10.0	125. 8.0	10. 10.0
140. 7.8	150. 3.0	100. 8.8	125. 8.1	324. 3.7	100. 8.4	150. 7.5	25. 10.1
201. 7.0	400. 5.0	124. 8.0	180. 7.7	350. 2.7	150. 7.8	200. 6.9	50. 10.0
225. 6.9	425. 2.8	150. 7.8	200. 7.0	375. 1.4	201. 7.0	225. 6.8	100. 8.8
250. 6.1	450. 0.8	178. 7.1	224. 6.8	429. 0.0	226. 6.8	250. 6.2	125. 8.3
276. 5.5	501. -1.0	200. 7.0	250. 6.3	450. -0.6	251. 6.2	275. 9.6	173. 7.2
301. 4.4		225. 6.8	275. 5.5	500. -1.3	278. 5.5	301. 9.2	201. 6.9
340. 3.5		251. 6.3	300. 4.0		301. 5.0	326. 3.0	225. 6.8
375. 2.1		302. 4.8	325. 4.3		351. 2.8	351. 2.2	250. 6.2
401. 1.6		340. 2.9	350. 2.8		375. 1.3	401. -1.3	275. 5.7
450. -0.9		402. -0.9	375. 1.3		401. -0.7	424. -0.5	326. 3.8
501. -1.1		450. -0.2	400. -0.5		431. 0.0	451. -1.0	351. 2.5
		476. 0.9	425. -0.2		451. -0.6		401. -0.6
		500. -1.0	450. -0.8		476. -0.10		426. -0.3
			476. -1.0				475. -0.4
			501. -2.0				501. -1.1

103

DATE 630523	DATE 630611	DATE 630626	DATE 630712	DATE 630724	DATE 630807	DATE 630823	DATE 630905						
BRYV 17	BRYV 18	BRYV 19	BRYV 20	BRYV 21	BRYV 22	BRYV 23	BRYV 24						
TIME 1200													
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100.	8.8	0.	10.4	850.	8.2	-14	10.1	-1.	10.1	69.	10.0	100.	8.8
125.	7.5	89.	10.0	300.	9.5	50.	9.8	89.	10.0	50.	10.0	100.	9.0
150.	6.8	100.	8.8	350.	3.0	100.	8.8	99.	8.9	100.	8.8	150.	7.8
200.	6.8	150.	7.8	370.	2.3	150.	7.8	150.	7.8	150.	7.9	202.	6.8
225.	6.8	200.	8.7	401.	-1.0	199.	8.9	200.	8.0	201.	8.9	251.	8.3
251.	6.0	225.	8.8	425.	-1.2	250.	8.2	250.	8.2	225.	8.8	277.	8.2
270.	5.0	250.	6.2	450.	-1.1	275.	6.0	276.	6.2	251.	6.3	301.	6.2
300.	5.8	275.	8.2			301.	5.3	300.	5.8	276.	6.0	325.	8.7
325.	3.8	300.	4.9			325.	4.2	325.	2.9	301.	6.3	351.	3.1
350.	1.8	325.	3.0			351.	1.9	351.	1.9	325.	4.5	377.	1.8
401.	-2	350.	2.3			373.	-1.8	374.	-1.6	351.	3.2	401.	1.0
451.	-1.1	375.	1.8			401.	-1.3	400.	-1.2	376.	1.5	425.	-1
		400.	1.7			425.	-1.3	425.	-1.4	401.	-1.5	451.	-2
		425.	-1.2			450.	-1.7	423.	-1.1	423.	-1.1	501.	-0.8
		450.	-1.1					451.	-1.3				

DATE 630925	DATE 631009	DATE 631028	DATE 631114	DATE 640117	DATE 640218	DATE 640312	DATE 640409
BRVY 25	BRVY 26	BRVY 27	BRVY 28	BRVY 30	BRVY 31	BRVY 32	BRVY 33
TIME 1200							
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-35.	11.7	30.	9.9	-35.	11.1	0.	10.7
-33.	11.1	101.	8.5	-33.	11.1	50.	9.7
0.	10.9	152.	7.6	0.	10.5	303.	8.9
90.	9.8	208.	6.5	90.	9.9	101.	8.9
181.	8.7	227.	6.8	180.	10.1	129.	8.0
192.	7.4	252.	5.0	190.	9.0	152.	7.0
271.	6.6	277.	4.8	181.	8.9	202.	7.1
272.	6.1	302.	2.9	151.	8.0	252.	5.6
276.	5.7	333.	1.8	202.	6.8	303.	4.8
277.	5.1	363.	0.8	227.	6.3	326.	4.2
301.	4.5	329.	-1.0	277.	6.3	353.	2.8
326.	3.4	348.	-1.8	302.	7.0	374.	1.7
346.	1.8	405.	-1.1	327.	7.2	403.	1.6
370.	1.3	429.	-0.5	378.	7.9	393.	-0.1
403.	0.3	493.	-1.1	402.	7.4	479.	-1.9
474.	-0.7			433.	-0.6	460.	-1.0
				478.	-1.8	588.	-1.6
					920.	-2.4	

DATE 640527	DATE 640624	DATE 640831	DATE 640925	DATE 641203	DATE 650120	DATE 650628	DATE 650904	
BRVY 34	BRVY 35	BRVY 36	BRVY 37	BRVY 38	BRVY 39	BRVY 40	BRVY 41	
TIME 1200								
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0.	10.7	11.	10.8	0.	10.5	50.	11.7	
49.	9.7	50.	8.7	50.	9.8	51.	10.8	
100.	8.6	100.	8.9	101.	8.7	100.	9.4	
191.	7.7	151.	7.8	151.	8.0	151.	8.7	
201.	7.1	201.	7.5	202.	7.8	202.	8.3	
271.	6.0	251.	6.0	252.	6.2	302.	7.2	
308.	4.6	302.	4.2	302.	5.9	353.	5.7	
356.	2.8	353.	2.4	353.	3.6	403.	3.7	
402.	-1.8	378.	3.2	403.	2.0	453.	2.0	
454.	-0.8	403.	-1.6	454.	1.0	504.	1.0	
503.	-0.1	453.	-0.8	503.	-1.1	554.	0.8	
	479.	-1.3	508.	-1.0	554.	-1.8	594.	-1.6
		584.	-1.0	608.	-1.8	655.	-2.4	
					695.	-2.4	698.	-1.6
						733.	-1.7	
							839.	-1.9

DATE 651029	DATE 651226	DATE 660126	DATE 660326	DATE 660626	DATE 661103	DATE 670116	DATE 670303
BRVT 82	BRVV 87	BRVV 84	BRVV 85	BRVT 46	BRVV 87	BRVV 88	BRVV 89
TIME 1200							
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0. 12.2	0. 12.9	0. 10.7	0. 12.5	0. 12.8	0. 12.8	0. 12.5	0. 12.5
51. 10.3	50. 10.6	100. 9.7	89. 10.8	49. 10.4	49. 10.7	40. 10.5	50. 10.3
100. 9.4	100. 9.1	150. 8.9	100. 9.5	100. 9.5	100. 9.7	100. 9.6	101. 9.2
152. 8.7	151. 8.7	200. 8.3	151. 8.8	150. 8.8	150. 8.8	151. 8.7	151. 8.7
202. 7.7	202. 7.8	251. 7.6	201. 8.0	201. 8.0	201. 8.1	201. 8.0	201. 8.0
252. 6.8	252. 7.6	301. 6.7	251. 7.5	251. 7.5	251. 7.6	251. 7.6	252. 7.6
302. 6.4	302. 6.4	351. 5.6	301. 7.1	301. 7.3	302. 7.3	302. 7.4	301. 6.1
352. 7.0	340. 6.6	402. 6.7	351. 5.6	351. 5.4	352. 7.3	352. 6.2	352. 2.9
377. 6.8	353. 5.6	402. 3.7	402. 3.3	402. 3.3	402. 2.9	403. 3.2	402. 1.6
403. 3.2	402. 3.7	553. 1.5	402. 2.8	402.	403. 2.2	403. 3.0	403. 0.13
428. 2.4	494. 3.3	663. >1.1	553. >1.6	503. >1.8	503. >1.0	503. >1.0	503. >1.7
454. 1.9	403. 2.0	663. >1.9		553. >1.2	553. >1.1		
478. 1.8	554. .1			603. >1.3			
504. 0.0	604. >1.9						
564. >1.5	653. >3.1						

DATE 670415	DATE 670416	DATE 671113	DATE 680115	DATE 680124	DATE 680130	DATE 680208	DATE 680213
BRVV 50	BRVV 51	BRVV 52	BRVV 53	BRVV 50	BRVV 55	BRVV 50	BRVV 57
TIME 1200	TIME 1204	TIME 1200	TIME 1200				
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0. 12.3	200. 8.2	0. 12.8	71. 12.1	0. 12.1	200. 8.2	-1. 12.0	>1. 12.0
49. 10.5	250. 8.2	50. 11.4	49. 11.4	50. 11.3	250. 8.7	49. 11.3	49. 11.1
100. 9.3	300. 7.4	100. 10.0	100. 10.0	100. 9.7	300. 6.8	99. 9.7	100. 9.6
149. 8.7	350. 6.1	150. 9.2	150. 9.2	150. 9.2	350. 3.7	150. 9.2	150. 9.0
200. 8.2	400. 6.9	200. 8.1	200. 9.2	200. 9.2	400. 1.6	200. 9.0	200. 9.0
250. 7.9	450. 3.7	250. 8.1	250. 8.3	250. 8.7	450. >3	250. 8.3	250. 8.2
300. 6.8	500. 1.8	300. 7.3	300. 6.3	300. 6.4	500. >2.0	300. 6.8	300. 6.9
350. 6.3	550. >3	350. 8.2	350. >3	350. >6	550. >2.0	350. >1	350. >1
400. 5.8	600. >1.3	400. 3.6	400. 2.7	400. 3.6	390. >1.6	400. 1.9	400. 1.8
450. 3.1	450. 2.0	450. 1.0	450. 1.0	450. 1.0	450. >3	449. >3	449. >1
500. 1.8	550. .6	550. >1.2	500. >1.8	500. >1.8	500. >3.0	500. >3	500. >1.1
550. .7	550. >0.9	550. >4.1	550. >3.0				
600. >1.8							
650. >1.3							
700. >1.8							

DATE 680221	DATE 680226	DATE 680307	DATE 680313	DATE 680328	DATE 681007	DATE 681025	DATE 681115
BRVV 58	BRVV 59	BRVV 60	BRVV 61	BRVV 62	BRVV 63	BRVV 64	BRVV 65
TIME 1200							
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-1.	12.1	50.	11.1	-1.	12.1	100.	0.
50.	11.6	101.	9.8	49.	11.0	200.	7.9
100.	9.7	150.	9.1	99.	9.9	300.	9.9
150.	9.0	201.	9.1	149.	9.1	400.	9.0
200.	9.1	250.	8.2	200.	9.2	500.	8.8
250.	8.1	300.	4.8	250.	8.2	600.	4.1
300.	6.8	350.	4.0	300.	7.0	700.	0.0
350.	4.8	400.	2.1	350.	4.3	800.	-1.1
400.	2.1	450.	1.6	400.	2.4	900.	-2.4
450.	1.4	500.	0.8	450.	1.1	1000.	-2.8
500.	.5	550.	0.0	500.	0.0	1100.	-1.1
550.	-1.2	590.	-2.2	550.	-1.3	1200.	-1.3
600.	-2.1	650.	-2.0	600.	-1.3	1300.	-1.3

DATE 681220	DATE 690113	DATE 690122	DATE 690129	DATE 690205	DATE 690212	DATE 690219	DATE 690226
BRVV 66	BRVV 67	BRVV 68	BRVV 69	BRVV 70	BRVV 71	BRVV 72	BRVV 73
TIME 1200							
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0.	12.3	0.	12.3	0.	12.3	0.	12.3
50.	11.1	50.	10.9	50.	10.8	50.	10.8
100.	10.0	100.	9.9	100.	9.9	100.	9.9
150.	9.1	150.	9.1	140.	9.1	150.	9.2
200.	8.5	200.	8.4	200.	8.5	200.	8.4
250.	8.0	250.	8.0	240.	8.8	250.	8.7
300.	6.0	300.	6.0	300.	6.2	300.	6.4
350.	4.9	350.	4.8	350.	4.2	350.	4.0
400.	3.3	400.	3.3	400.	2.6	400.	2.7
450.	1.6	450.	2.2	450.	1.5	450.	2.1
500.	1.1	500.	1.1	500.	0.3	500.	0.5
550.	-1.2	550.	-1.4	550.	-1.9	550.	-2.7

DATE 690305	DATE 690312	DATE 690319	DATE 690407	DATE 690923	DATE 691023	DATE 691120	DATE 691216
BRVY 74	BRVY 75	BRVY 76	BRVY 77	BRVY 78	BRVY 79	BRVY 80	BRVY 81
TIME 1200							
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0.	12.4	0.	12.4	0.	12.7	0.	12.8
50.	10.7	50.	10.6	50.	10.9	50.	10.8
100.	9.8	100.	9.9	100.	10.0	100.	9.8
150.	9.1	150.	9.1	150.	9.2	200.	9.1
200.	8.5	200.	8.5	200.	8.5	250.	8.4
250.	6.5	250.	6.4	250.	5.9	250.	7.7
300.	2.6	300.	3.7	300.	6.5	300.	6.6
350.	-0.6	150.	1.8	300.	4.7	350.	3.8
400.	0.0	400.	1.1	350.	2.0	380.	3.0
450.	0.8	450.	-0.1	400.	-0.3	400.	2.3
500.	-0.6	500.	-1.8	450.	1.3	450.	-0.4
550.	-2.2	550.	-0.1	500.	-1.9	500.	-1.3
600.	-1.0	550.	-1.8	550.	-0.7	550.	-2.3
650.	-2.2	650.	-1.0	600.	-0.9	550.	-1.6
700.	-2.8	700.	-1.6	600.	-1.0	600.	-1.8
750.	-3.8	750.	-0.1	650.	-1.6	650.	-1.2
				500.	-1.8	700.	-1.7
				550.	-2.2	750.	-0.2
				600.	-3.1	800.	
				650.	-0.2	850.	

DATE 700118	DATE 700121	DATE 700128	DATE 700204	DATE 700211	DATE 700218	DATE 700225	DATE 700304
BRVY 82	BRVY 83	BRVY 84	BRVY 84	BRVY 86	BRVY 87	BRVY 88	BRVY 89
TIME 1200							
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0.	12.5	0.	12.6	0.	12.7	0.	12.8
75.	10.6	24.	10.7	16.	10.8	23.	10.7
80.	10.6	50.	10.8	50.	10.8	50.	10.7
100.	10.2	100.	10.1	100.	10.2	100.	10.2
150.	9.3	150.	9.3	150.	9.3	200.	9.3
200.	8.8	200.	8.8	200.	8.8	250.	8.8
250.	8.8	250.	7.8	250.	8.8	250.	7.8
290.	8.0	100.	8.8	250.	7.7	250.	8.0
300.	8.0	150.	9.8	300.	9.8	300.	9.5
350.	4.7	350.	9.0	350.	5.8	350.	3.2
400.	3.2	370.	4.8	350.	5.8	350.	1.7
410.	3.1	400.	3.7	360.	5.3	450.	1.0
450.	2.2	450.	1.0	400.	1.0	500.	0.0
470.	1.1	400.	-1.5	450.	1.4	450.	-0.3
500.	-0.5	550.	-0.8	460.	1.0	550.	-1.2
550.	-2.5	500.	-1.2	500.	-0.8	600.	-2.8
		550.	-2.8	550.	-0.8	550.	-2.8

DATE	700311	DATE	700318	DATE	700518	DATE	700606	DATE	701015	DATE	701106	DATE	701209	DATE	701218
BRVY	90	BRVY	91	BRVY	92	BRVY	93	BRVY	94	BRVY	95	BRVY	96	BRVY	97
TIME	1200														
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0.	12.6	0.	12.6	0.	12.6	0.	12.6	0.	11.8	0.	11.5	0.	11.0	0.	11.7
20.	10.7	20.	10.7	20.	10.8	20.	10.8	20.	10.9	20.	10.8	20.	10.8	20.	10.8
40.	10.7	30.	10.7	50.	10.7	50.	10.7	100.	10.1	60.	10.5	100.	9.0	50.	11.1
100.	10.1	100.	10.2	100.	10.1	100.	10.1	100.	8.0	65.	11.2	200.	8.5	100.	10.3
150.	9.3	150.	9.3	150.	9.3	150.	9.1	200.	8.4	50.	10.8	250.	7.9	150.	9.1
200.	8.7	200.	8.7	200.	8.8	200.	8.5	250.	7.2	100.	10.3	300.	8.3	200.	8.7
250.	8.8	250.	8.8	250.	8.8	250.	7.5	300.	5.8	150.	9.1	350.	8.5	227.	8.4
300.	8.0	300.	8.0	300.	8.7	300.	9.9	350.	5.1	200.	8.7	400.	9.1	250.	7.9
350.	6.4	350.	3.7	350.	3.9	350.	5.1	400.	6.3	229.	8.2	450.	2.0	300.	9.1
400.	3.4	400.	3.0	400.	3.7	400.	4.6	450.	6.4	250.	7.3	500.	0.0	350.	4.6
450.	2.0	450.	2.8	450.	1.8	450.	3.1	500.	3.5	300.	6.4	550.	2.9	571.	3.9
500.	1.7	500.	1.2	500.	1.8	500.	2.0	500.	2.1	350.	9.4	600.	-2.0	400.	2.0
550.	1.0	550.	1.1	550.	1.2	550.	1.7	400.	3.8	400.	3.0	550.	1.8	500.	1.5
600.	0.4	600.	0.1	600.	0.1	600.	0.2	450.	0.2	500.	1.8	600.	1.8	500.	1.5
650.	-2.8	650.	-2.8	650.	-1.3	650.	-2.2	550.	-0.8	600.	-2.0	650.	-1.4	700.	-1.4
700.	-3.2	700.	-1.6	700.	-3.5	700.	-3.7	500.	-2.3	550.	-2.3	750.	-3.1	750.	-3.1

DATE	710113	DATE	710209	DATE	710311	DATE	710412	DATE	710607	DATE	710816	DATE	711004	DATE	711213
BRVY	98	BRVY	99	BRVY	100	BRVY	101	BRVY	102	BRVY	103	BRVY	108	BRVY	109
TIME	1200														
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0.	11.7	0.	11.8	0.	12.0	0.	12.1	0.	11.8	0.	11.2	0.	12.0	0.	12.2
20.	11.0	20.	11.0	10.	10.8	50.	10.7	50.	10.7	10.	10.8	50.	11.0	50.	11.1
100.	10.2	100.	10.2	90.	10.7	100.	9.8	100.	10.0	50.	10.8	100.	10.0	100.	10.1
150.	9.1	150.	9.2	150.	10.0	150.	9.1	150.	9.0	100.	10.0	150.	9.1	150.	9.0
200.	8.6	200.	8.6	150.	9.2	200.	8.5	200.	8.5	150.	9.1	200.	8.6	200.	8.5
250.	8.1	250.	8.1	200.	8.7	250.	8.5	250.	8.1	200.	8.4	250.	8.4	250.	8.2
300.	6.2	300.	6.2	250.	5.2	300.	7.6	300.	7.4	250.	8.1	300.	8.0	300.	8.0
350.	4.3	350.	5.3	300.	6.9	350.	6.0	350.	7.3	300.	7.3	350.	6.9	325.	6.1
400.	5.8	400.	2.7	350.	6.9	400.	5.0	400.	5.1	350.	7.0	400.	3.6	350.	3.6
450.	2.8	450.	1.2	400.	4.4	450.	2.9	450.	2.2	380.	6.0	450.	2.1	400.	1.0
500.	-0.5	500.	-0.1	450.	2.9	475.	1.0	475.	1.0	400.	5.1	500.	-1.1	450.	1.8
550.	-1.4	550.	-1.3	475.	1.6	500.	-0.6	500.	-0.6	425.	3.2	550.	-2.3	500.	0.8
600.	-0.8	600.	-0.8	550.	-3.7	550.	-3.7	550.	-2.1	550.	-2.1	550.	-2.1	550.	-2.1
650.	-2.0	650.	-2.0	600.	-4.7	600.	-4.7	600.	-4.7	500.	-1.8	550.	-0.7	575.	-0.5

DATE 720110	DATE 720214	DATE 720222	DATE 720317	DATE 720810	DATE 720821	DATE 721620	DATE 721208
BRVY 106	BRVY 107	BRVY 108	BRVY 109	BRVY 110	BRVY 111	BRVY 112	BRVY 113
TIME 1200							
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0, 12.3	0, 12.2	0, 12.4	0, 12.3	0, 12.6	0, 12.0	0, 12.4	0, 12.4
30, 11.2	30, 10.9	30, 11.0	30, 11.0	30, 11.0	30, 11.0	30, 11.3	30, 11.0
100, 10.0	100, 10.2	100, 10.1	100, 10.1	100, 10.1	100, 11.0	100, 10.3	100, 10.0
150, 9.0	150, 9.0	150, 9.0	150, 9.0	150, 9.1	150, 9.0	150, 9.2	150, 9.1
200, 8.5	200, 8.4	200, 8.6	200, 8.8	200, 8.6	200, 8.6	200, 8.6	200, 8.7
250, 8.3	250, 8.3	250, 8.6	250, 8.8	250, 8.8	250, 8.2	250, 8.6	250, 8.7
300, 8.0	300, 8.2	300, 8.8	300, 9.0	300, 9.6	300, 9.1	300, 7.2	300, 8.6
350, 7.8	350, 8.0	350, 8.0	350, 8.5	350, 8.7	350, 8.4	350, 8.7	350, 8.7
400, 7.6	400, 7.7	400, 8.6	400, 8.3	400, 8.2	375, 2.2	400, 8.3	400, 1.6
450, 7.7	450, 7.8	450, 1.3	450, 1.7	450, 1.6	400, 1.4	450, 1.6	450, 1.1
500, 7.2	500, 7.6	500, 8.7	500, 8.6	500, 8.3	450, 0.7	500, 8.6	500, 8.8
550, -2.2	-2.1	-	-	-	500, 8.6	-	-

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DATE 730103	DATE 730216	DATE 730310	DATE 730325	DATE 730405	DATE 730418	DATE 730501
BRVY 114	BRVY 115	BRVY 116	BRVY 117	BRVY 118	BRVY 119	BRVY 120
TIME 1100	TIME 1000	TIME 900	TIME 700	TIME 1300	TIME 1200	TIME 1100
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0, 12.3	0, 12.3	0, 12.4	0, 12.4	0, 12.8	0, 12.0	0, 12.4
30, 10.9	30, 10.9	30, 10.8	30, 10.7	30, 10.7	30, 10.7	30, 10.7
100, 9.8	100, 10.0	100, 9.9	100, 9.9	100, 9.9	100, 9.9	100, 9.9
150, 9.0	150, 9.1	150, 9.1	150, 9.1	150, 9.1	150, 9.0	150, 9.1
200, 8.7	200, 8.7	200, 8.7	200, 8.8	200, 8.7	200, 8.6	200, 8.7
250, 7.9	250, 7.4	250, 7.7	250, 8.7	225, 8.7	220, 8.6	250, 8.7
300, 7.0	300, 6.1	250, 6.0	300, 8.8	225, 8.0	220, 7.9	300, 8.6
350, 2.6	350, 1.0	300, 3.3	350, 1.6	250, 6.6	250, 6.4	350, 1.9
400, 1.3	400, 1.7	350, 1.6	400, 1.0	300, 8.5	300, 8.3	400, -0.8
450, -0.1	450, 0.7	400, 0.9	450, 0.0	350, 2.9	350, 3.0	450, 0.1
500, -2.8	500, -1.0	450, -2.1	500, 2.2	400, 1.7	400, 1.0	500, -3.0

DATE 621074	DATE 621101	DATE 621109	DATE 621212	DATE 630109	DATE 630116	DATE 630122	DATE 630130								
SHVV															
TIME 1200															
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30.	7.2	3.	7.0	27.	7.8	42.	7.0	0.	7.5	26.	7.6	100.	6.6	-1.	7.0
63.	7.2	25.	7.7	30.	7.1	34.	8.0	27.	7.5	101.	6.5	126.	6.0	25.	7.5
120.	7.0	65.	7.5	196.	6.5	36.	7.9	75.	7.1	127.	6.3	175.	6.8	50.	7.3
150.	5.0	106.	6.5	184.	6.0	84.	6.8	100.	6.7	131.	5.9	201.	5.4	78.	7.0
256.	5.6	155.	5.8	237.	6.5	164.	6.0	126.	6.0	177.	6.7	251.	3.4	49.	6.5
306.	5.6	212.	5.8	244.	5.0	180.	7.2	150.	5.9	202.	6.6	278.	3.2	124.	6.0
327.	6.0	284.	6.5	301.	6.0	201.	6.7	187.	6.8	226.	5.2	301.	8.6	169.	5.9
365.	6.7	283.	6.6	406.	7.5	264.	2.8	200.	6.4	250.	4.8	351.	1.1	175.	6.8
407.	7.0	321.	5.4	473.	-2.0	338.	-3	226.	5.4	274.	3.1	393.	0.3	190.	6.7
456.	7.4	381.	8.7			406.	-7	250.	6.1	327.	1.7	426.	-1.0	200.	6.5
488.	-2.1	423.	1.3			472.	-2.3	277.	3.1	351.	1.6			225.	3.4
		466.	0.4			532.	-0.1	350.	-9	376.	1.3			250.	4.7
								374.	-2	400.	-3			301.	3.3
								428.	-3	432.	-4			325.	2.4
								450.	-7	451.	-7			350.	2.0
								476.	-1.3	476.	-1.3			400.	-8
														450.	-3
														475.	-5
														501.	-1.0

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DATE 630203	DATE 630213	DATE 630221	DATE 630227	DATE 630307	DATE 630313	DATE 630321	DATE 630802								
SHVV															
TIME 1200															
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189.	6.0	250.	6.7	-1.	7.6	300.	5.8	150.	6.0	-1.	7.6	300.	4.9	191.	6.7
175.	6.7	275.	6.0	30.	7.4	325.	5.3	175.	6.6	24.	7.5	327.	5.3	225.	5.6
200.	6.4	100.	3.6	74.	7.1	368.	6.8	200.	6.2	50.	7.2	334.	6.3	250.	4.8
450.	4.5	350.	3.6	128.	6.1	400.	1.5	226.	5.7	74.	7.0	351.	3.9	275.	4.7
270.	4.2	400.	1.6	150.	6.0	426.	-6	250.	4.7	100.	6.5	400.	-6	300.	5.4
301.	3.8	450.	0.6	176.	6.6	451.	0.0	275.	4.3	129.	6.0	429.	1.2	326.	5.5
350.	1.8	475.	-1.0	200.	6.4	476.	-1.1	291.	6.0	150.	6.0	451.	0.2	350.	3.4
401.	1.0			251.	5.0			300.	4.9	100.	6.7	475.	-1.1	375.	2.2
426.	.7			276.	4.3			325.	5.0	251.	5.0	501.	-1.0	401.	1.3
475.	-1.0			350.	3.0			351.	3.8	275.	4.5			426.	.8
				401.	2.0			375.	1.7	300.	5.0			475.	.7
				445.	.8			400.	.8	330.	5.1			501.	-1.7
								481.	0.0	351.	3.8				
								476.	-1.1	375.	2.0				
										400.	.8				
										432.	.1				
										451.	.9				
										474.	.9				

DATE 030523	DATE 030611	DATE 030626	DATE 030712	DATE 030724	DATE 030807	DATE 030823	DATE 030909				
BRVY 17	BRVY 18	BRVY 19	BRVY 20	BRVY 21	BRVY 22	BRVY 23	BRVY 24				
TIME 1800											
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25.	0.0	0.	0.6	0.	0.0	0.	0.6	27.	7.6	301.	6.0
41.	9.4	23.	8.1	25.	7.7	24.	7.8	175.	6.2	25.	7.0
74.	7.3	50.	9.1	51.	8.1	50.	8.0	200.	6.1	50.	7.4
99.	6.5	75.	7.1	75.	7.6	100.	6.5	224.	5.3	77.	7.3
124.	6.0	100.	6.4	125.	6.1	126.	5.8	450.	5.0	100.	6.0
151.	6.0	121.	6.1	151.	6.1	151.	6.0	300.	6.0	127.	6.0
174.	6.2	151.	6.6	200.	6.3	176.	6.6	325.	6.9	150.	6.1
200.	6.0	175.	6.4	226.	6.7	224.	6.0	351.	2.4	174.	6.6
225.	5.6	200.	6.3	251.	5.0	250.	5.0	400.	5.3	200.	5.0
251.	4.4	250.	5.0	325.	5.6	300.	5.6	428.	0.0	224.	5.0
277.	4.7	325.	6.0	351.	4.4	525.	5.6	450.	5.5	251.	6.1
285.	5.0	350.	5.8	401.	1.7	350.	8.7	476.	5.9	279.	5.4
323.	5.6	377.	2.1	426.	1.8	400.	0.0	501.	6.0	302.	6.0
350.	5.5	401.	1.8	481.	0.0	480.	0.0	501.	5.5	325.	5.0
375.	3.8	429.	1.4	501.	0.1	480.	0.1	501.	4.0	373.	2.6
402.	1.4	452.	1.9	521.	0.1	500.	0.0	501.	2.6	400.	1.3
423.	1.1	479.	0.1	541.	0.1	500.	0.0	501.	1.3	450.	0.2
451.	.5	501.	-1.4	577.	0.1	500.	0.0	501.	0.3	477.	0.0
477.	0.1	501.	0.0	501.	-1.4	500.	0.0	501.	0.4	500.	0.7
501.	0.0	501.	0.0	501.	-1.3	500.	0.0	501.	-1.0	501.	0.0

DATE 030923	DATE 031008	DATE 031028	DATE 031118	DATE 040117	DATE 040218	DATE 040312	DATE 040409						
BRVY 25	BRVY 26	BRVY 27	BRVY 28	BRVY 30	BRVY 31	BRVY 32	BRVY 33						
TIME 1200	TIME 1800	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1800	TIME 1200						
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125.	8.0	0.	7.3	25.	7.0	-23.	8.7	0.	7.4	0.	7.6	0.	7.6
151.	6.2	24.	8.0	40.	8.4	0.	7.3	26.	8.1	50.	8.0	50.	8.1
175.	6.2	51.	8.0	101.	8.6	27.	8.1	51.	8.1	70.	7.5	101.	6.5
202.	5.6	76.	7.8	126.	8.0	50.	8.3	76.	7.9	101.	6.8	151.	6.2
222.	4.7	101.	4.3	151.	6.0	100.	6.5	102.	6.7	128.	6.5	202.	6.7
277.	4.4	126.	4.0	176.	6.2	126.	9.9	127.	6.4	151.	6.5	253.	5.1
320.	1.7	151.	6.3	226.	5.2	151.	6.5	177.	7.0	176.	6.9	304.	3.4
377.	.8	177.	6.0	252.	6.3	201.	6.8	202.	6.8	202.	6.8	393.	2.2
403.	1.2	201.	5.2	277.	5.8	227.	6.4	292.	6.9	252.	5.3	403.	.5
428.	.2	227.	6.1	302.	4.0	302.	1.9	201.	3.7	277.	4.6	453.	0.4
453.	0.4	252.	5.7	326.	3.7	327.	1.3	303.	3.0	303.	1.3	504.	0.0
303.	3.2	343.	3.7	377.	0.4	377.	0.4	353.	1.0	328.	2.1	533.	0.5
328.	7.0	377.	1.0	403.	0.9	403.	0.9	380.	1.7	378.	.8	598.	0.0
352.	1.2	402.	0.9	453.	0.4	453.	0.1	404.	1.3	403.	0.0	504.	0.0
378.	.3	453.	0.4	479.	0.9	479.	0.9	454.	1.2	429.	0.8	533.	0.7
403.	0.0	479.	0.9	493.	0.4	493.	0.4	479.	0.9	434.	0.7	504.	1.7
453.	0.1	493.	0.4	503.	0.1	503.	0.1	493.	0.4	479.	0.3	533.	0.6

DATE 670915	DATE 670919	DATE 671213	DATE 680115	DATE 680116	DATE 680119	DATE 680203	DATE 680208	DATE 680215
BRVY 50	BRVY 51	BRVY 52	BRVY 53	BRVY 54	BRVY 55	BRVY 56	BRVY 57	BRVY 58
TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200
----	----	----	----	----	----	----	----	----
0.	0.7	0.	0.4	0.	0.6	0.	0.5	0.
40.	9.4	50.	9.2	50.	9.3	49.	9.4	50.
100.	8.0	100.	8.5	101.	8.1	99.	8.2	100.
150.	7.2	150.	6.9	150.	7.1	149.	7.2	150.
200.	7.4	200.	7.3	200.	7.2	200.	7.3	200.
250.	5.7	250.	6.0	250.	6.8	250.	6.0	250.
300.	3.8	300.	4.8	285.	5.6	350.	6.7	300.
350.	5.8	350.	2.9	300.	4.9	400.	5.3	351.
400.	2.8	401.	1.2	350.	2.5	450.	2.8	400.
450.	1.7	450.	.3	401.	1.4	400.	.6	450.
500.	-1.6	500.	-1.0	450.	.6	550.	-0.8	500.
550.	0.0	450.	-1.8	500.	0.6	800.	-2.0	550.
600.	-1.0			524.	-1.2	950.	-2.5	
700.	-2.3							

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DATE 680221	DATE 680224	DATE 680307	DATE 680313	DATE 680522	DATE 681007	DATE 681025	DATE 681115
BRVY 58	BRVY 59	BRVY 60	BRVY 61	BRVY 62	BRVY 63	BRVY 64	BRVY 65
TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200
----	----	----	----	----	----	----	----
0.	9.1	-1.	9.0	0.	9.5	200.	7.9
40.	9.6	50.	9.0	404.	9.7	250.	7.7
100.	8.8	99.	9.4	100.	8.9	300.	4.9
150.	7.6	150.	7.7	150.	7.8	351.	2.7
200.	7.9	200.	7.9	200.	7.9	401.	.7
250.	7.7	250.	7.7	250.	7.8	450.	0.9
300.	6.2	300.	6.0	300.	6.0	500.	-0.8
350.	4.5	350.	3.8	350.	4.9	525.	-2.4
400.	2.1	400.	1.9	400.	1.9	450.	2.0
450.	.6	450.	.5	450.	0.0	500.	1.7
500.	-1.8	500.	-1.2	500.	-1.8	550.	0.0
550.	-2.3	550.	-2.3				

DATE 691220	DATE 690113	DATE 690122	DATE 690129	DATE 690205	DATE 690212	DATE 690219	DATE 690226
BRVY	BRVY	BRVY	BRVY	BRVY	BRVY	BRVY	BRVY
TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200
-----	-----	-----	-----	-----	-----	-----	-----
0.	7.1	0.	7.0	0.	7.0	0.	6.9
50.	8.3	50.	8.2	50.	8.2	50.	8.0
100.	8.3	100.	8.2	100.	8.2	100.	8.1
150.	7.8	150.	7.5	150.	7.6	150.	7.5
200.	7.7	200.	7.6	200.	7.6	200.	7.6
250.	6.0	250.	6.0	250.	6.0	250.	6.0
300.	4.6	300.	5.2	300.	3.7	300.	4.3
350.	3.9	350.	4.8	350.	2.0	350.	2.5
400.	2.5	400.	3.4	400.	1.2	400.	1.3
450.	1.6	450.	2.2	450.	1.1	450.	1.2
500.	0.2.5	500.	0.7.6	500.	0.2.2	500.	0.3
550.	0.2.5	550.	0.2.6	550.	0.2.6	550.	0.2.5
600.	0.2.2	600.	0.2.7	600.	0.1.7	600.	0.2.0
650.	0.3.0	625.	0.3.1	600.	0.3.0	575.	0.2.9
675.	0.3.7			690.	0.4.7		

DATE 690303	DATE 690312	DATE 690319	DATE 690427	DATE 690423	DATE 691023	DATE 691120	DATE 691216
BRVY	BRVY	BRVY	BRVY	BRVY	BRVY	BRVY	BRVY
TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200
-----	-----	-----	-----	-----	-----	-----	-----
0.	6.8	0.	8.8	0.	9.0	50.	9.0
50.	7.8	50.	7.0	50.	7.7	50.	9.0
100.	8.1	100.	8.1	100.	8.0	100.	8.1
150.	7.7	150.	7.8	150.	7.5	150.	7.4
200.	6.0	200.	6.6	200.	6.3	200.	7.0
250.	6.2	225.	5.5	275.	6.8	300.	6.9
295.	3.5	250.	3.8	250.	3.7	350.	4.7
340.	1.8	300.	2.2	275.	2.7	400.	1.3
400.	1.1	400.	1.7	380.	1.7	450.	1.9
450.	0.7	650.	0.1.4	400.	1.7	500.	0.2
500.	0.2.8	900.	0.3.2	450.	0.1.6	550.	0.2.7
550.	0.4.4			600.	0.2.7	550.	0.3.3
		480.	0.2.7			600.	0.4.8

DATE 700114	DATE 700121	DATE 700128	DATE 700204	DATE 700211	DATE 700218	DATE 700225	DATE 700304
BRVY A2	BRVY M3	BRVY B4	BRVY B5	BRVY B6	BRVY B7	BRVY B8	BRVY B9
TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200	TIME 1200
-----	-----	-----	-----	-----	-----	-----	-----
0.	8.4	0.	8.4	0.	8.4	0.	8.4
23.	7.3	4.	7.4	12.	7.9	10.	7.8
50.	6.8	50.	6.8	50.	6.8	50.	6.8
100.	6.4	100.	6.3	100.	6.0	100.	6.3
118.	6.0	119.	6.0	117.	6.0	116.	6.0
118.	6.0	120.	6.2	120.	6.0	120.	6.2
150.	6.7	150.	6.7	150.	6.7	150.	6.7
200.	7.1	200.	7.1	200.	7.1	200.	7.1
240.	7.4	250.	7.4	240.	7.4	250.	7.4
300.	6.4	300.	6.2	300.	6.2	300.	6.2
350.	3.9	350.	4.0	350.	4.1	350.	4.0
378.	3.3	365.	3.4	348.	3.1	400.	2.7
380.	6.0	387.	6.1	400.	3.8	450.	1.1
400.	3.4	400.	3.2	450.	1.8	400.	1.2
450.	1.5	450.	1.0	500.	0.2	500.	0.0
500.	0.0	500.	0.0	500.	0.0	600.	-1.0
550.	0.	550.	0.	600.	-1.5	600.	-1.2
600.	-0.4	600.	-0.5	610.	-1.7	650.	-0.1
650.	-0.2	650.	-0.4	670.	-0.8	680.	-0.7
700.	-0.2	700.	-0.2	700.	-0.2	700.	-0.2

DATE	700311	DATE	700318	DATE	700510	DATE	700526	DATE	701019	DATE	701108	DATE	701209	DATE	701210
BRVY	80	BRVT	91	BRVY	92	BRVY	93	BRVY	94	BRVY	95	BRVY	96	BRVY	97
TIME	1800	TIME	1200	TIME	1800	TIME	1800	TIME	1200	TIME	1800	TIME	1200	TIME	1800
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
0.	8.3	0.	8.4	0.	8.3	0.	8.3	0.	8.7	0.	8.4	0.	8.2	0.	8.4
22.	6.8	15.	6.9	15.	6.7	5.	7.3	50.	6.2	15.	6.7	50.	6.4	20.	6.8
50.	6.8	50.	6.8	40.	6.8	25.	6.9	180.	6.0	50.	6.3	150.	6.6	50.	6.8
100.	6.3	100.	6.3	100.	6.2	50.	6.3	150.	6.6	100.	6.2	200.	6.8	100.	6.0
120.	6.1	150.	6.6	150.	6.5	100.	6.2	200.	6.6	110.	5.8	250.	7.0	150.	6.6
150.	6.5	200.	7.1	200.	7.0	150.	6.5	250.	7.4	130.	6.7	300.	6.2	200.	7.1
200.	7.0	250.	7.6	250.	7.7	200.	7.8	300.	6.3	150.	6.7	350.	6.5	250.	7.8
250.	7.6	300.	8.5	300.	8.6	250.	7.5	350.	7.8	200.	7.0	400.	7.0	300.	7.9
300.	8.4	350.	9.3	350.	9.1	300.	8.3	400.	8.1	250.	7.4	450.	9.0	310.	7.4
350.	9.4	400.	9.6	400.	9.5	350.	9.0	425.	9.4	300.	8.7	500.	9.8	350.	9.0
400.	9.5	450.	10.0	450.	10.1	370.	9.4	450.	9.7	350.	9.0	550.	9.8	400.	9.0
450.	10.7	500.	11.0	500.	11.3	400.	10.2	500.	10.4	400.	9.3	600.	11.0	410.	10.6
500.	11.8	550.	12.2	550.	12.3	450.	11.3	520.	11.8	450.	10.5	650.	11.8	450.	11.8
550.	12.2	600.	12.9	600.	12.0	500.	11.1	550.	12.2	480.	11.7	700.	12.6	500.	12.6
600.	12.8	650.	12.9	645.	12.8	550.	11.1	600.	11.6	500.	11.8	750.	12.8	550.	12.8
650.	12.8	700.	13.0	655.	12.4	570.	12.7	650.	12.8	550.	12.1	800.	13.0	650.	12.0
700.	12.0	750.	13.1	700.	13.0	650.	12.8	700.	13.3	600.	12.3	850.	13.1	700.	12.0
750.	13.1	800.	13.1	700.	13.5	650.	13.5	700.	13.5	650.	13.1	900.	13.1	750.	13.1

DATE	710113	DATE	710209	DATE	710311	DATE	710412	DATE	710507	DATE	710816	DATE	711006	DATE	711213
BRVY	88	BRVT	94	BRVY	98	BRVT	101	BRVY	102	BRVY	103	BRVT	104	BRVY	105
TIME	1800	TIME	1200	TIME	1800	TIME	1200	TIME	1800	TIME	1800	TIME	1200	TIME	1800
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
0.	8.3	0.	4.7	0.	8.3	0.	8.1	0.	8.7	0.	7.0	0.	7.0	0.	8.0
20.	6.2	15.	6.7	0.	6.6	10.	6.6	50.	5.8	13.	6.8	50.	6.1	50.	6.1
50.	6.0	50.	6.0	50.	5.8	50.	6.0	180.	5.3	50.	5.9	100.	5.8	100.	6.0
100.	6.4	100.	7.4	100.	5.4	100.	6.0	150.	6.0	100.	5.7	140.	6.2	150.	6.2
150.	6.9	150.	6.0	150.	6.2	150.	6.3	200.	6.6	150.	5.7	200.	6.7	200.	7.0
200.	7.7	200.	5.7	200.	6.7	200.	6.9	250.	7.2	200.	6.6	250.	7.0	250.	7.7
250.	7.3	250.	7.8	250.	7.7	250.	8.0	300.	8.0	250.	7.1	300.	6.8	300.	7.0
300.	7.1	300.	7.8	300.	7.4	300.	8.1	345.	8.0	300.	8.1	350.	8.2	350.	7.4
350.	5.0	317.	6.9	350.	4.5	350.	5.7	350.	5.8	350.	5.8	380.	5.1	400.	6.0
370.	5.0	350.	4.6	400.	2.7	400.	2.1	175.	4.2	380.	6.0	450.	1.7	450.	1.9
400.	1.7	400.	2.7	450.	2.0	450.	1.0	400.	3.0	400.	5.1	500.	.3	500.	1.8
450.	.3	450.	1.3	500.	.1	300.	.8	450.	1.3	450.	2.0	550.	.7	550.	.5
500.	-1.1	500.	0.0	540.	-1.0	525.	0.0	300.	-1.2	500.	.8	600.	-2.0	600.	-2.0
550.	0.0	550.	-1.0	570.	-8.0	550.	-1.8	550.	-2.4	550.	-1.3	600.	-1.0	600.	-1.0
600.	-1.8	565.	-2.2	600.	-1.3	600.	-2.8	600.	-4.0	600.	-1.6	650.	-3.1	650.	-3.1
650.	-1.4	650.	-1.4	600.	-1.6	650.	-3.5	650.	-4.0	650.	-3.1	700.	-3.1	700.	-3.1

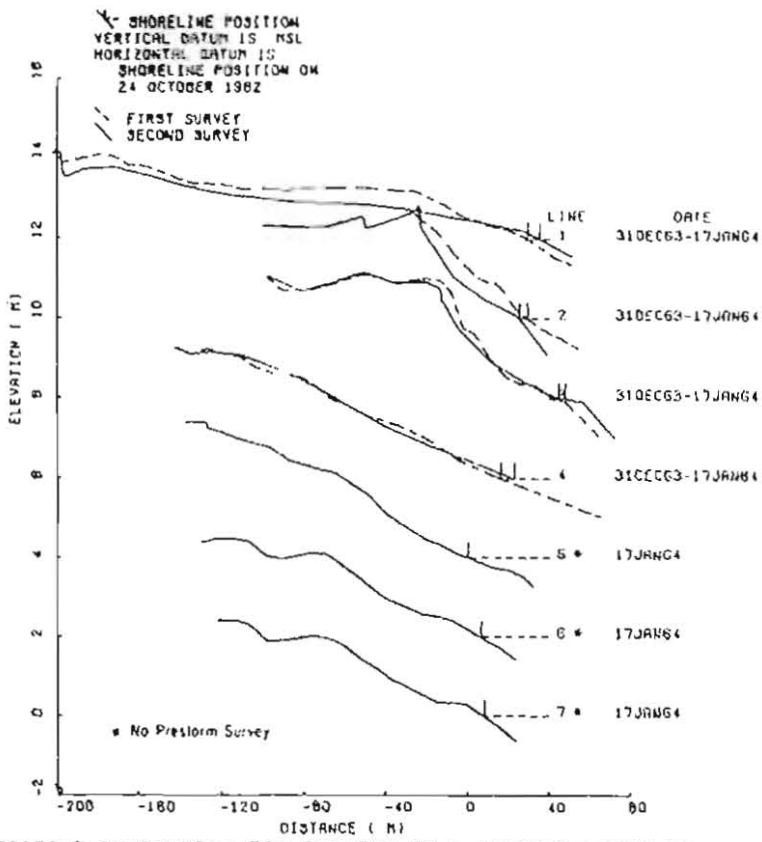
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BRVY	106	BRVY	107	BRVY	108	BRVY	109	BRVY	110	BRVY	111	BRVY	112	BRVY	113
TIME	1200	TIME	1300	TIME	1100	TIME	1500								
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
0,	8.1	0,	8.0	0,	8.0	0,	7.8	0,	7.7	0,	7.6	0,	7.2	0,	7.2
50,	8.1	50,	8.2	50,	8.2	50,	8.2	50,	8.2	50,	8.1	50,	7.3	50,	7.1
100,	6.0	100,	6.0	100,	6.0	100,	6.0	100,	6.0	100,	6.0	100,	7.0	100,	7.1
150,	6.2	150,	6.2	150,	6.2	150,	6.2	150,	6.1	150,	6.1	150,	6.3	150,	6.3
200,	6.8	200,	6.8	200,	7.1	200,	7.1	200,	7.1	200,	7.1	200,	7.3	200,	7.2
250,	7.5	250,	7.6	250,	7.7	250,	7.7	250,	7.8	250,	7.6	250,	7.6	250,	7.4
300,	8.6	300,	8.5	300,	8.4	300,	8.2	300,	8.2	300,	8.4	300,	7.6	300,	7.9
350,	7.1	350,	7.3	350,	7.3	350,	7.2	350,	7.3	350,	6.6	375,	8.0	350,	6.6
400,	3.3	400,	2.1	400,	2.1	400,	1.6	400,	1.7	380,	0.4	350,	0.7	400,	3.2
450,	1.6	450,	0.7	450,	0.7	450,	0.5	450,	0.6	400,	4.6	400,	2.0	425,	2.1
500,	0.6	500,	-0.6	500,	-1.3	500,	-0.8	500,	0.0	450,	1.3	425,	0.0	450,	1.2
550,	-0.4	550,	-1.2					550,	-1.4	500,	0.0	450,	-0.1	500,	-0.9
								550,	-1.0	500,	0.0	550,	-0.1	550,	-0.1
								575,	-2.7	550,	0.0			600,	-0.4

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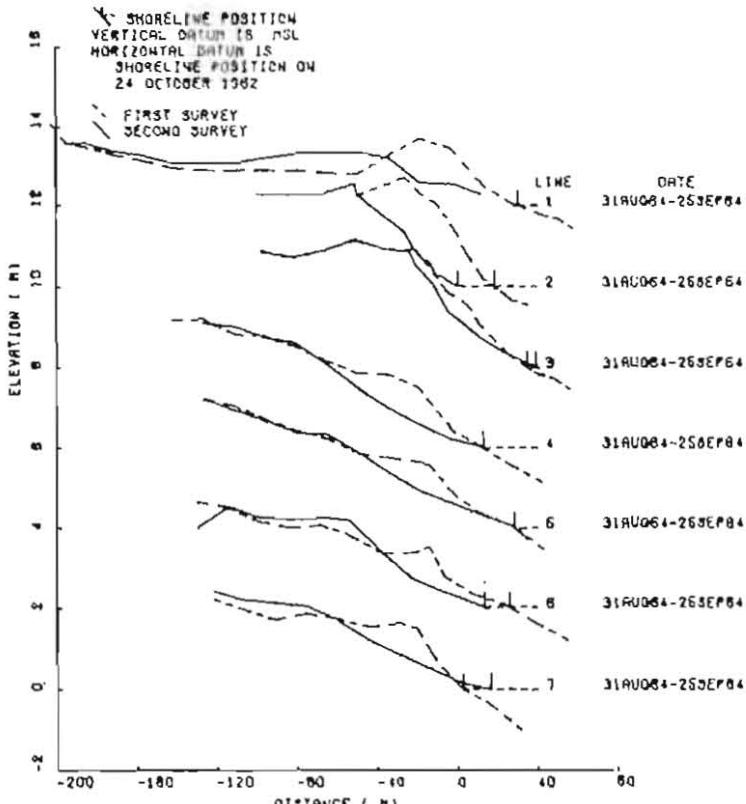
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BRVY	112	BRVY	115	BRVY	116	BRVY	117	BRVY	118	BRVY	119	BRVY	120	BRVY	1100
TIME	1100	TIME	1100	TIME	1000	TIME	000	TIME	1400 <th>TIME</th> <td>1300</td> <th>TIME</th> <td>1100</td> <th>-----</th> <th>-----</th>	TIME	1300	TIME	1100	-----	-----
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
0,	7.2	0,	7.5	0,	7.6	0,	7.1	0,	7.2	0,	7.1	0,	7.0		
50,	6.9	50,	6.9	50,	6.8	50,	6.9	50,	6.8	50,	6.8	50,	6.3		
100,	6.6	100,	6.1	100,	6.3	100,	6.1	100,	6.3	100,	6.1	100,	6.2		
150,	6.2	150,	6.3	150,	6.3	150,	6.4	150,	6.8	150,	6.3	150,	6.3		
200,	7.3	200,	7.4	200,	7.3	200,	7.4	200,	7.3	200,	7.3	200,	7.2		
250,	7.3	250,	7.4	250,	7.4	250,	7.4	250,	7.4	250,	7.3	250,	7.2		
300,	7.6	300,	7.7	300,	7.6	300,	7.6	300,	7.6	300,	7.7	300,	7.7		
350,	5.5	350,	4.9	350,	5.3	350,	4.9	315,	7.4	350,	4.6	350,	5.2		
400,	3.3	400,	2.4	400,	3.2	400,	4.9	350,	5.1	400,	4.2	400,	4.9		
450,	1.6	450,	1.3	450,	0.9	450,	1.2	400,	2.7	450,	1.5	450,	1.1		
500,	-0.3	500,	-0.6	500,	1.6			450,	-7	500,	-1.4				
550,	-1.4	550,	-1.1			600,	-1.9	480,	-0.7	550,	-2.4				
								580,	-1.8	550,	-2.3				
										562,	-0.8				
										565,	-0.4				
										600,	-1.4				
										650,	-0.8				
										700,	0.0				
										750,	-1.1				
										775,	-1.0				

APPENDIX C

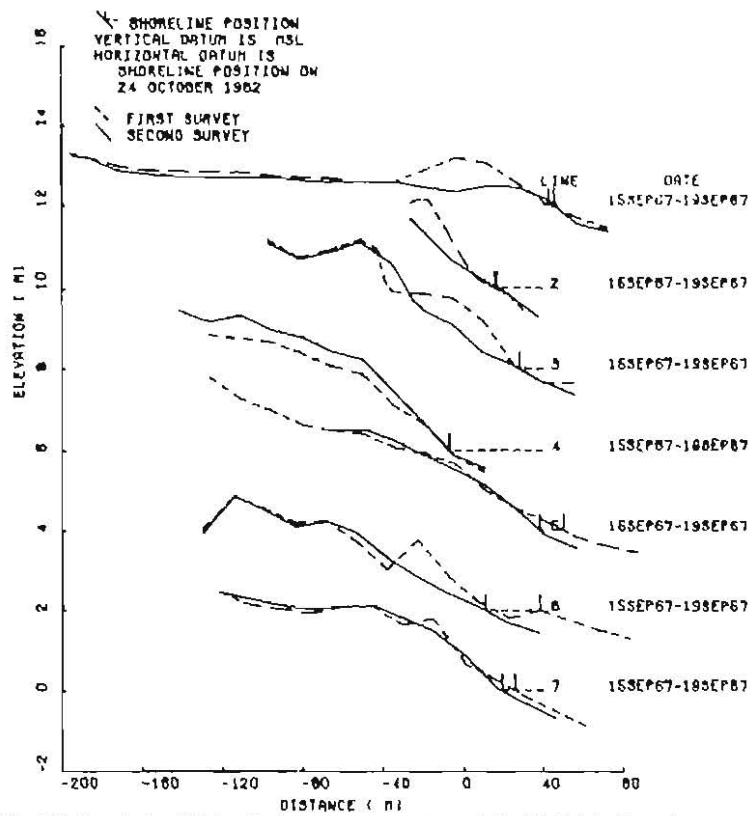
STORM CHANGE PLOTS - PROFILE COMPARISON
FOR SURVEY OF SEVEN PROFILE LINES AT ATLANTIC CITY



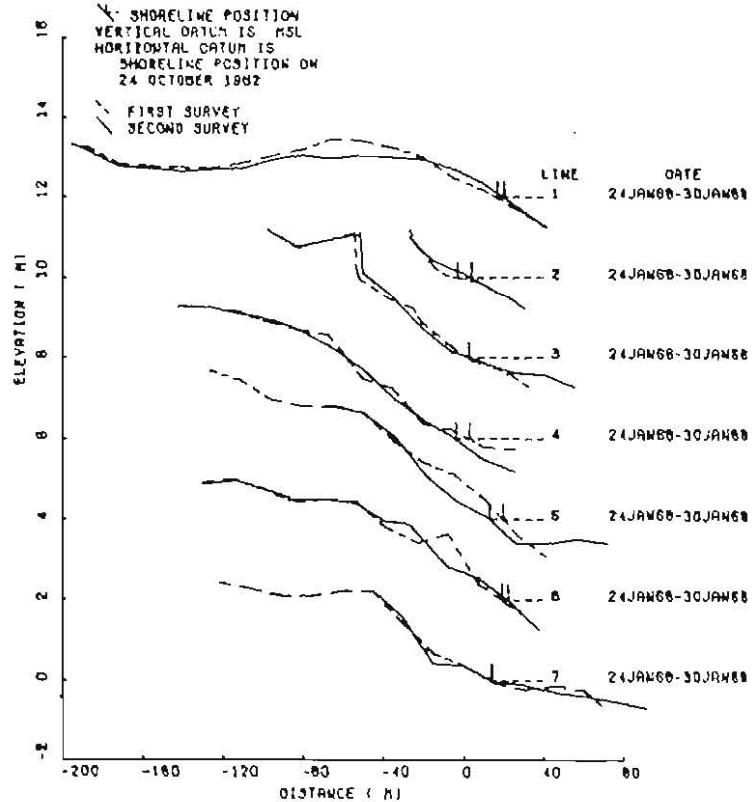
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



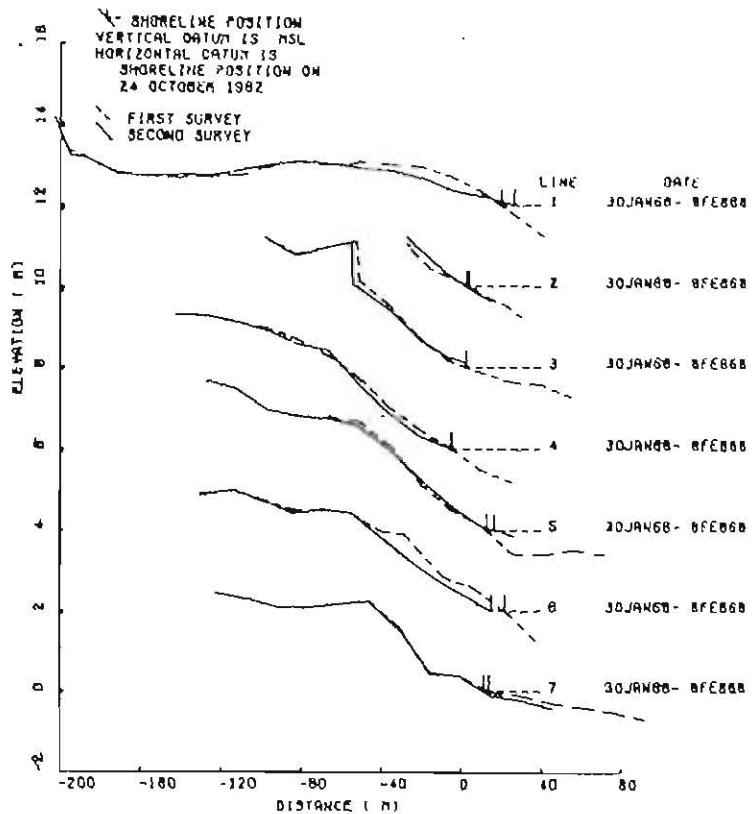
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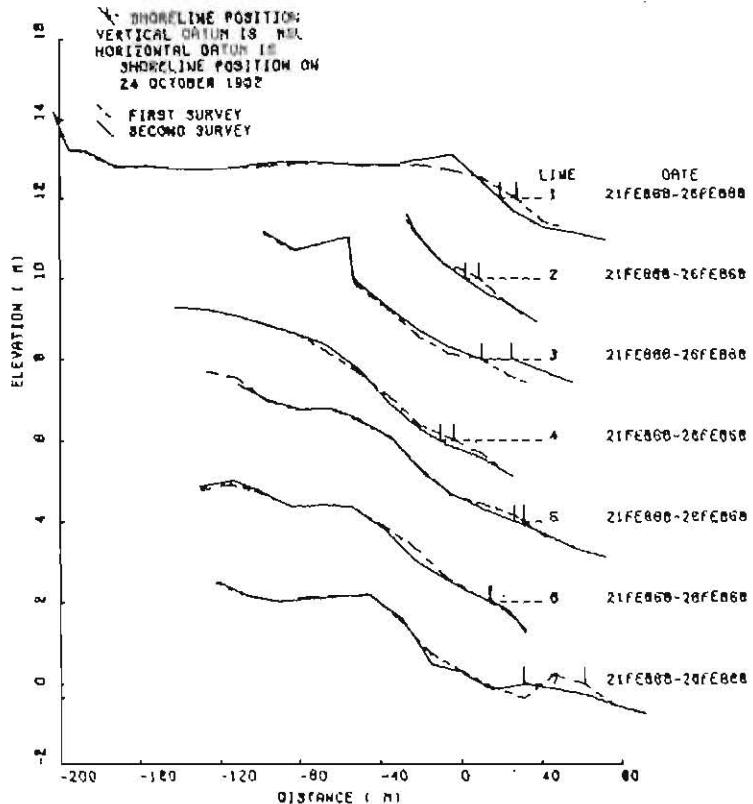
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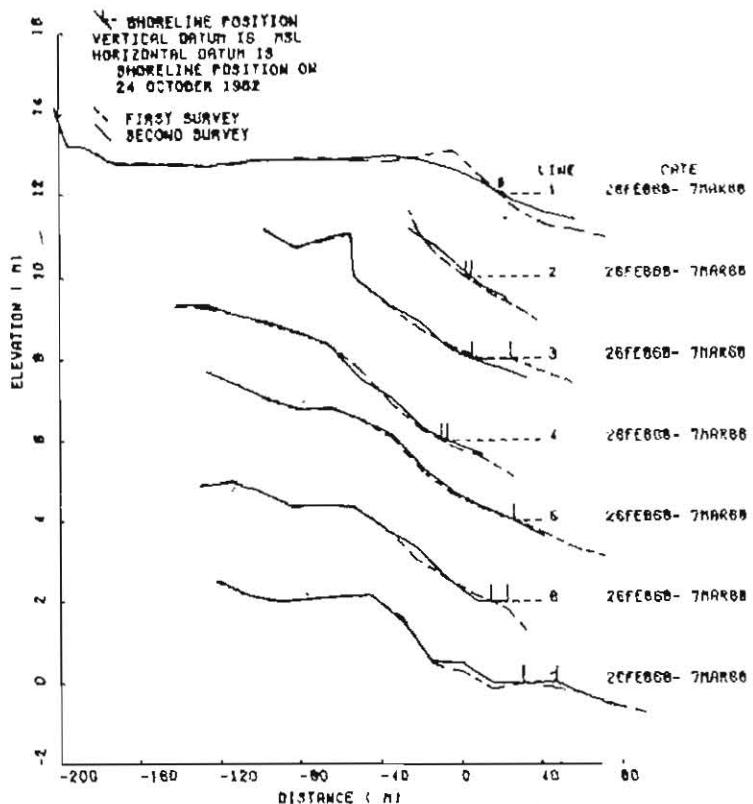
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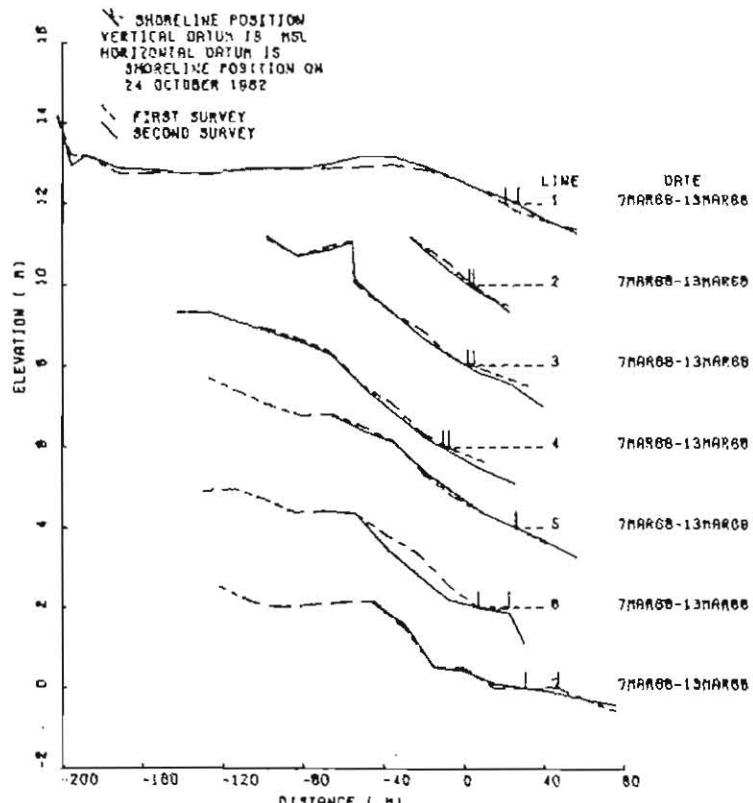
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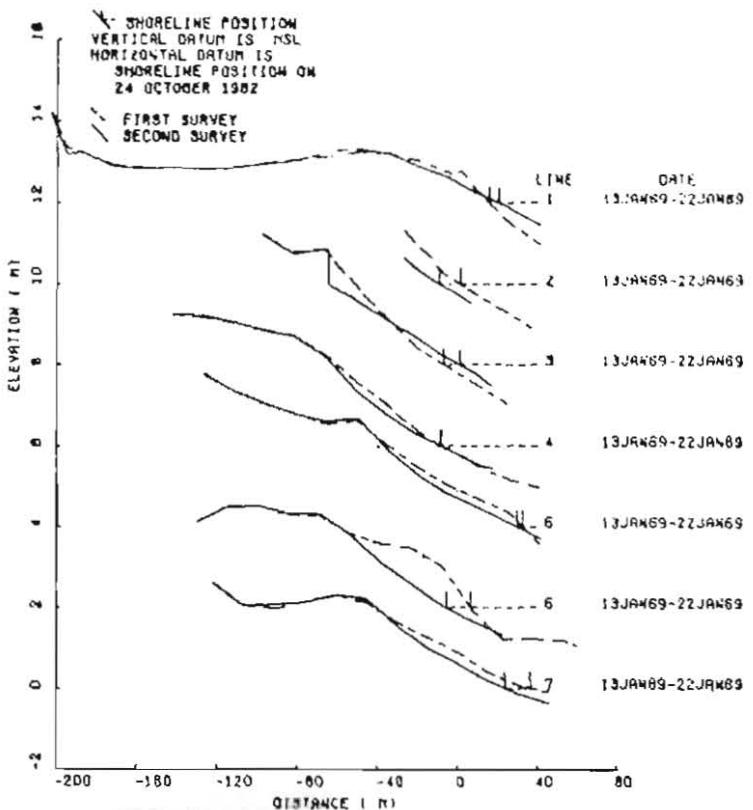
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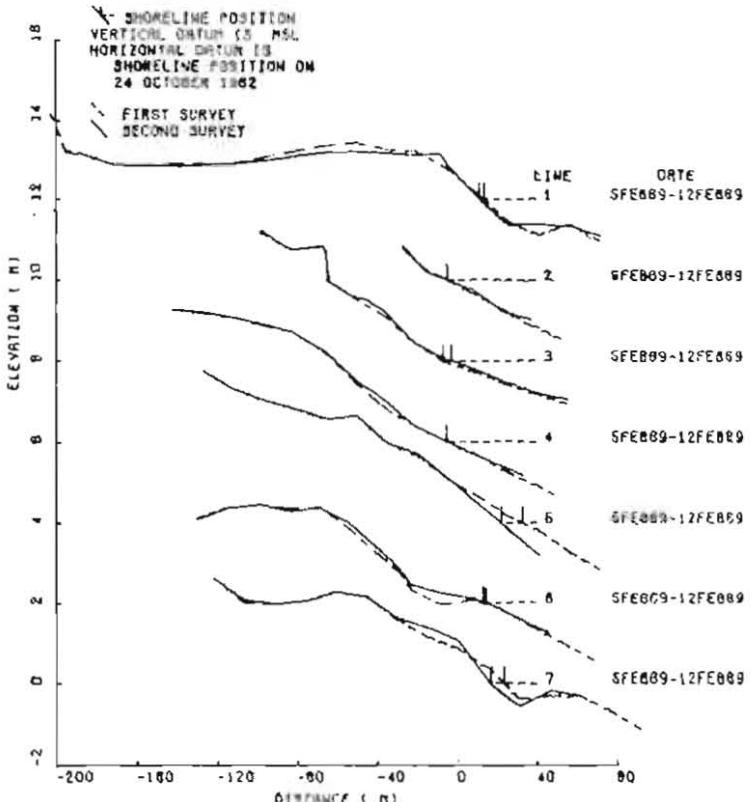
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT
ATLANTIC CITY NJ



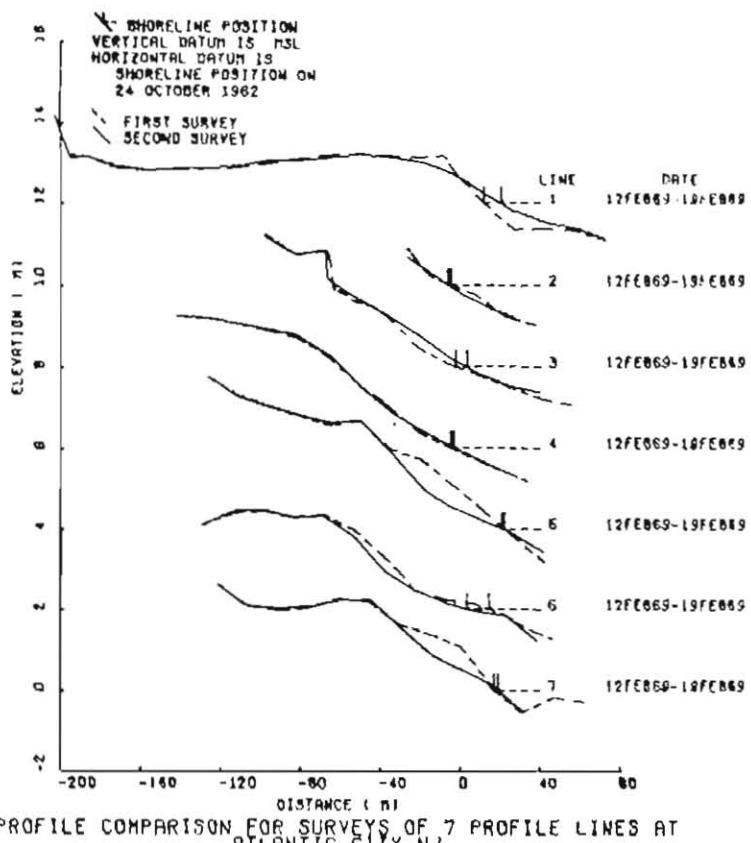
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT
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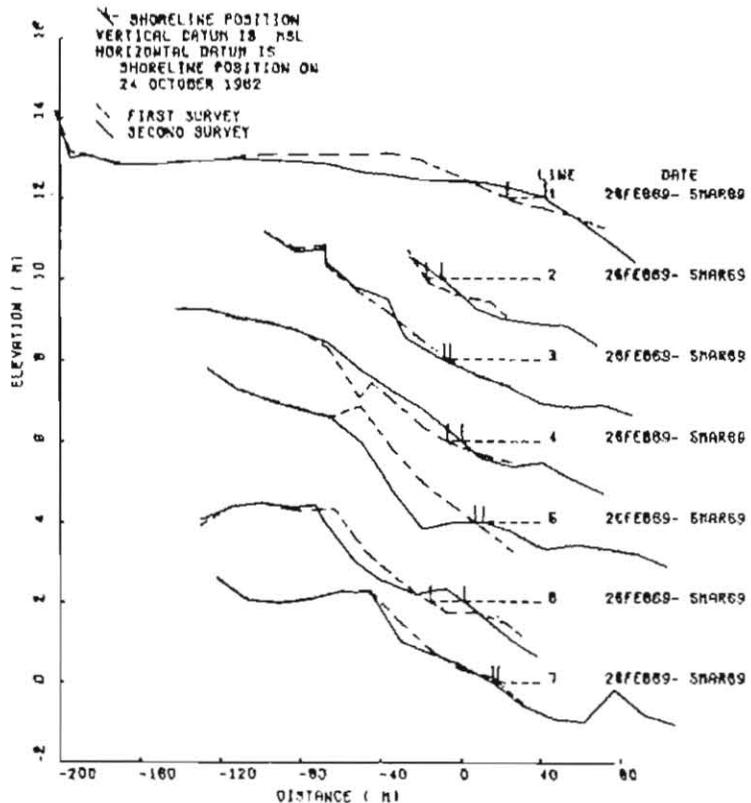
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



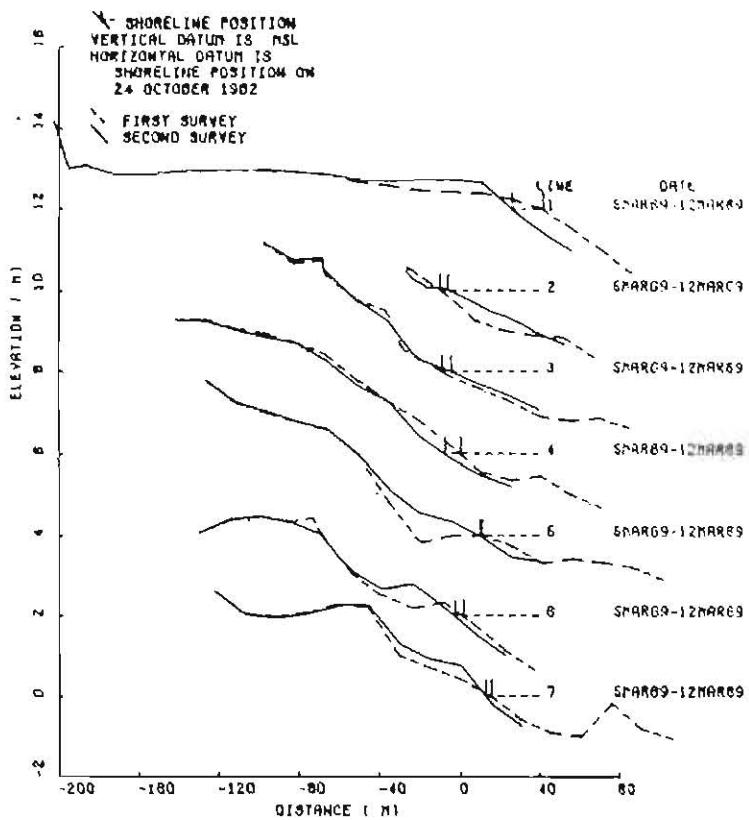
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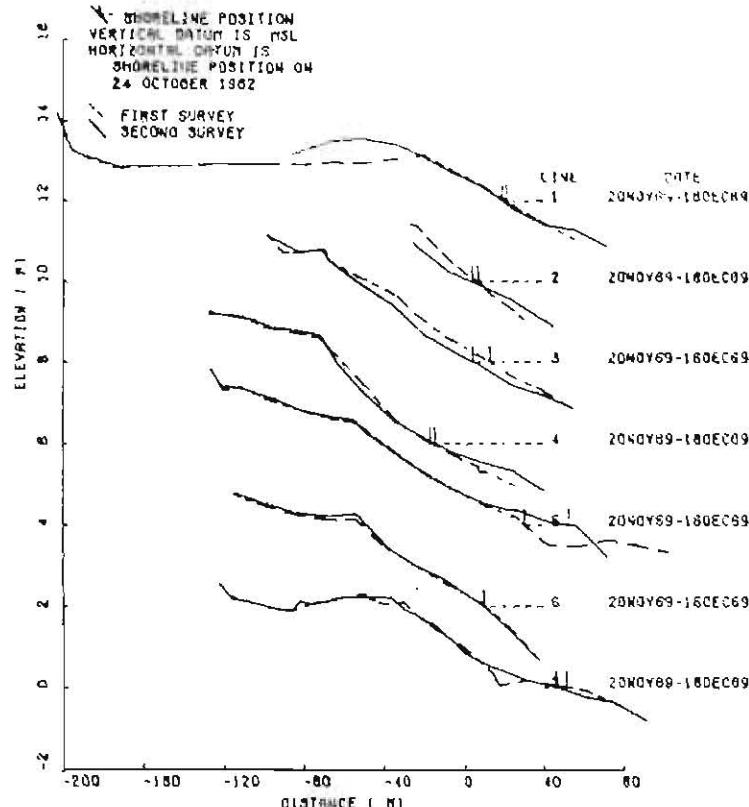
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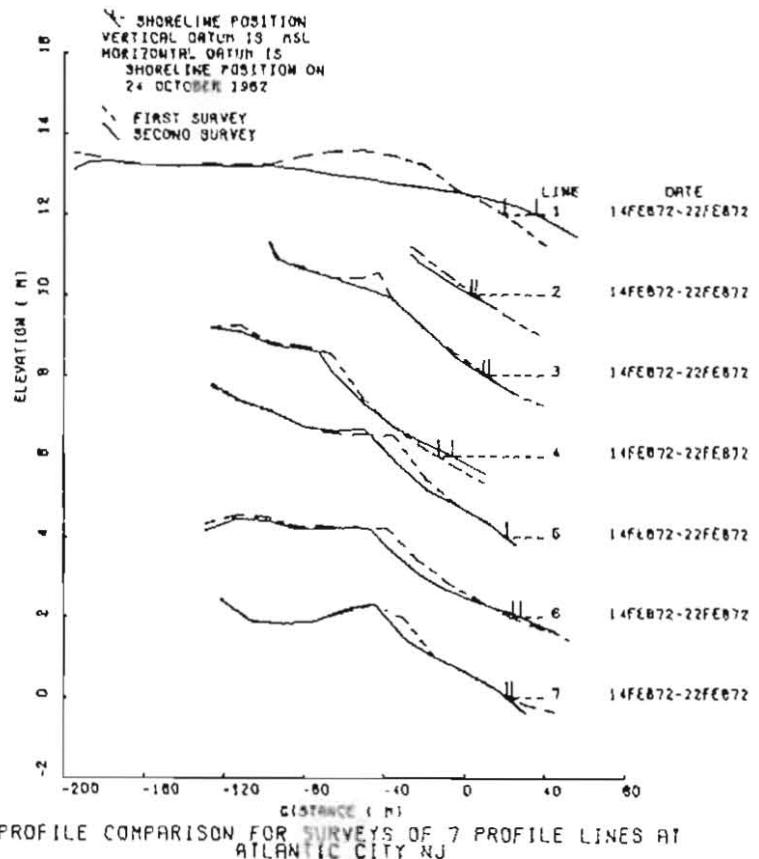
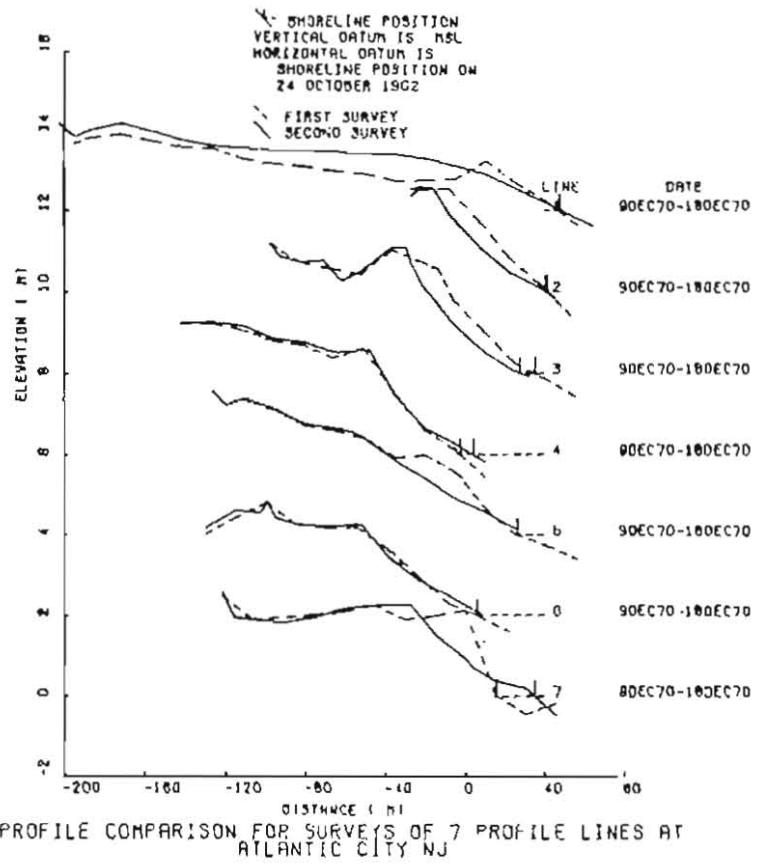
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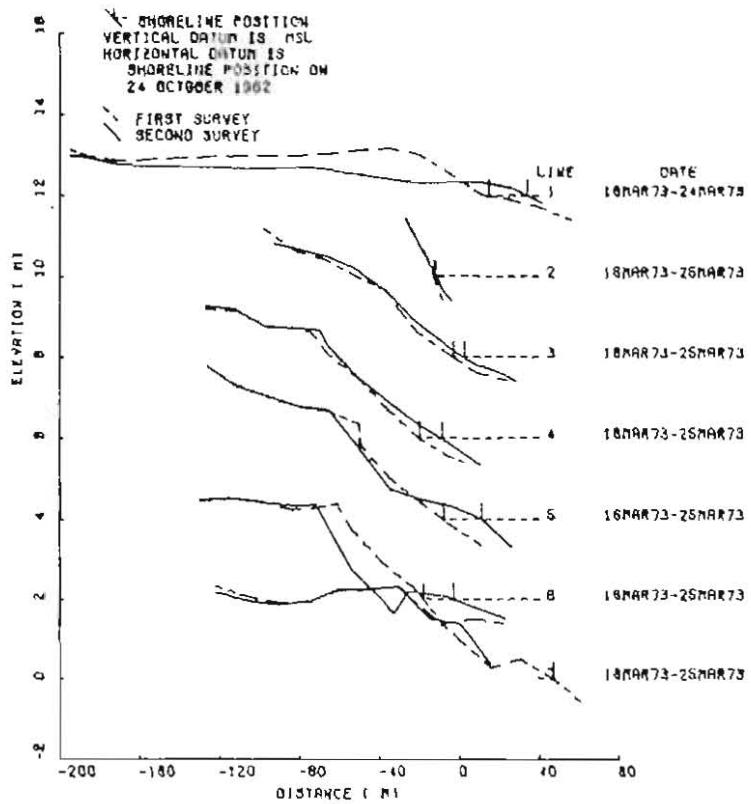


PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT
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PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT
ATLANTIC CITY NJ

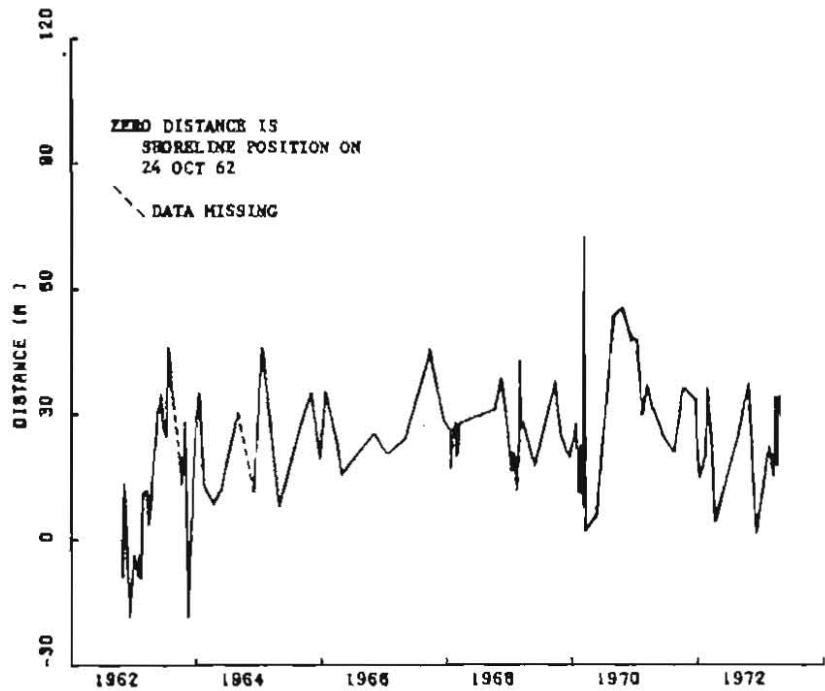




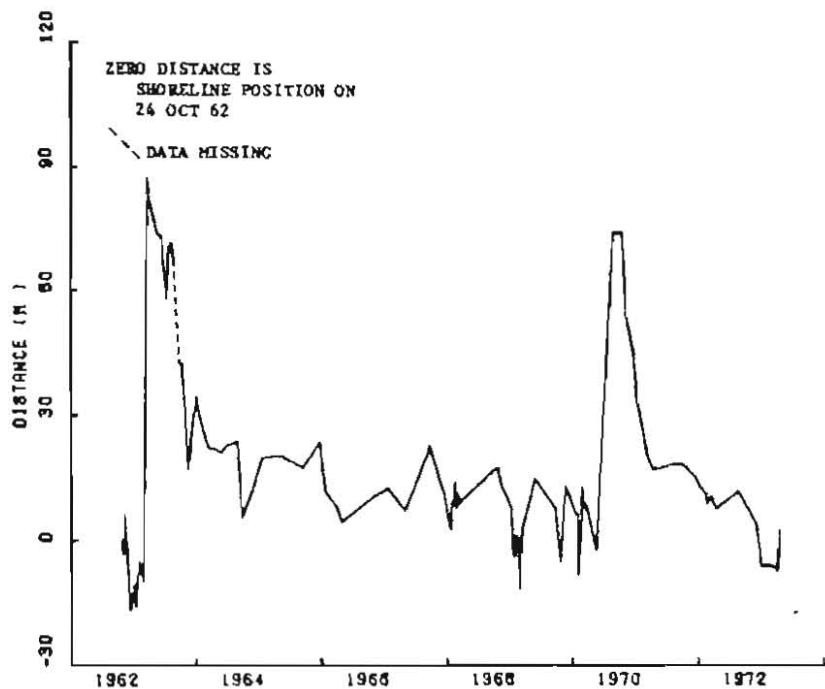
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT
ATLANTIC CITY NJ

APPENDIX D

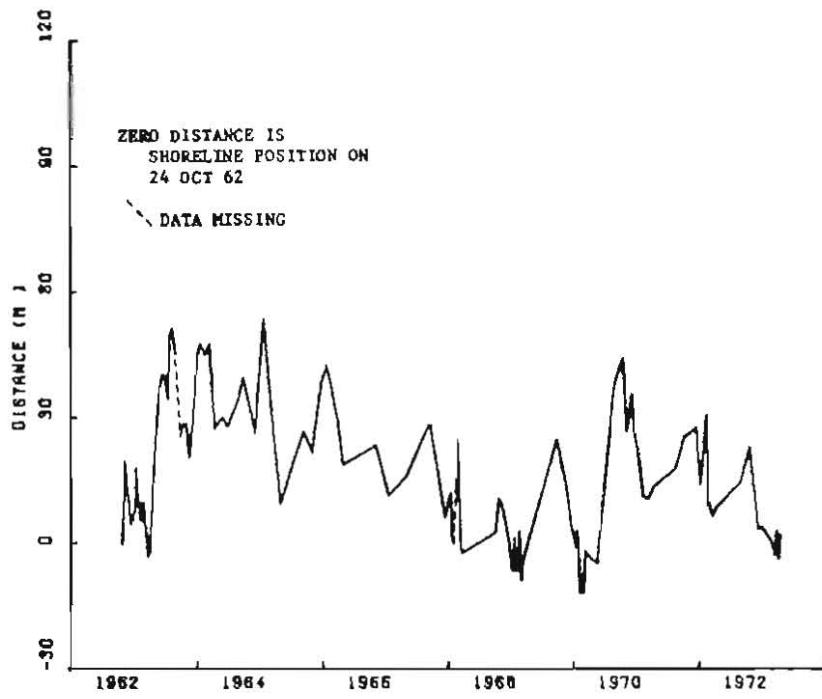
MSL SHORELINE CHANGES



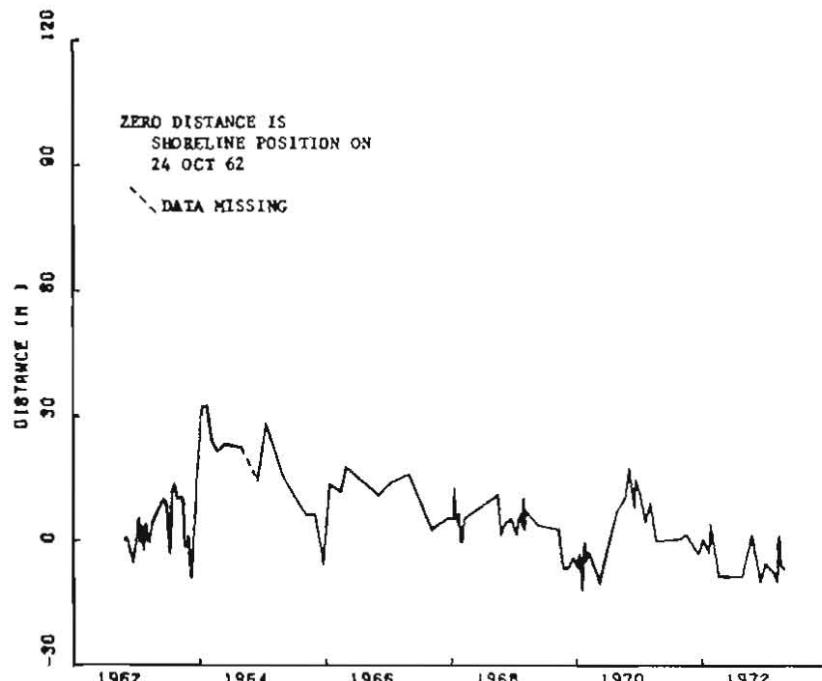
CHANGE IN DISTANCE TO MSL SHORELINE AT
PROFILE LINE 1 ATLANTIC CITY, NEW JERSEY



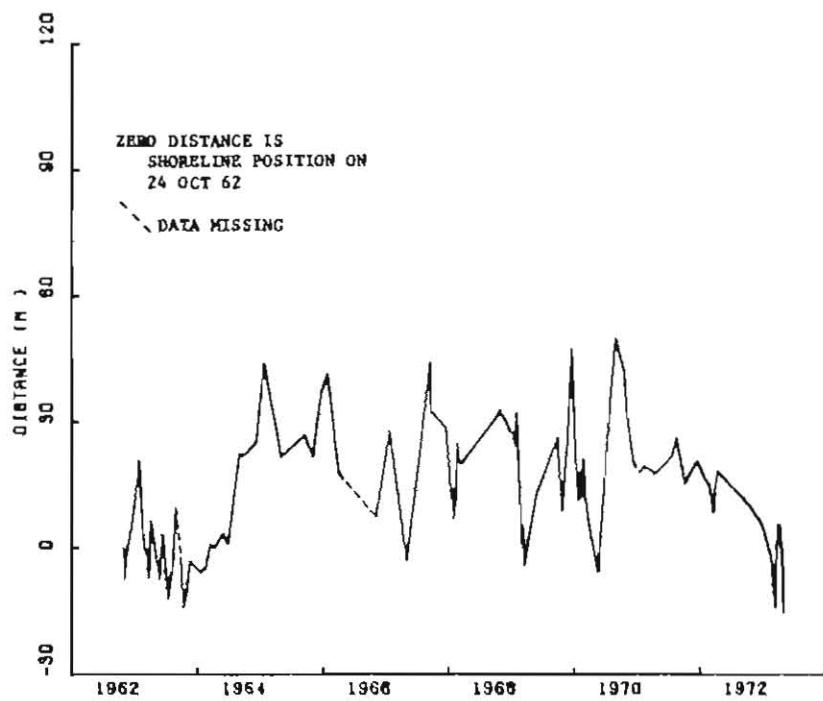
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PROFILE LINE 2 ATLANTIC CITY, NEW JERSEY



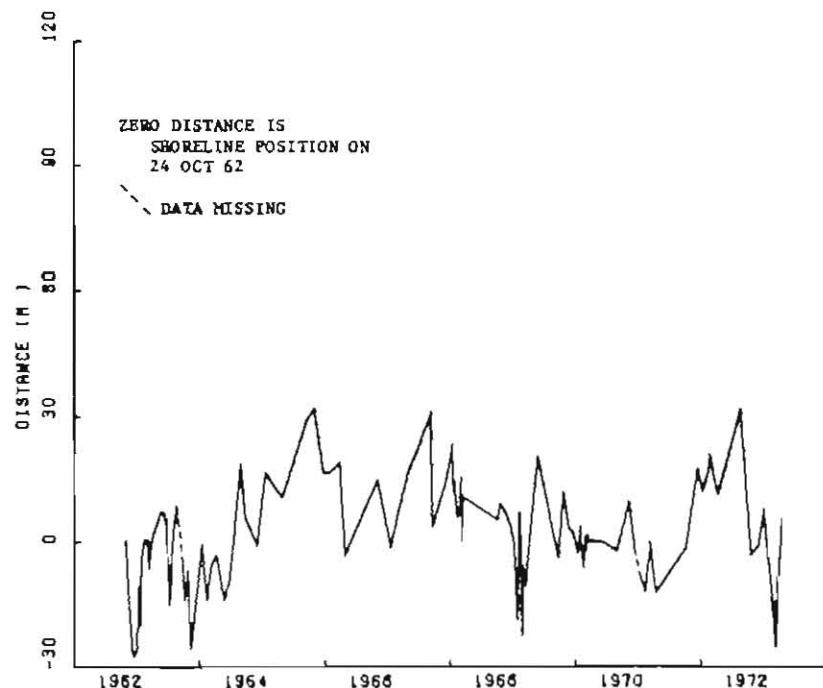
CHANGE IN DISTANCE TO MSL SHORELINE AT
PROFILE LINE 3 ATLANTIC CITY, NEW JERSEY



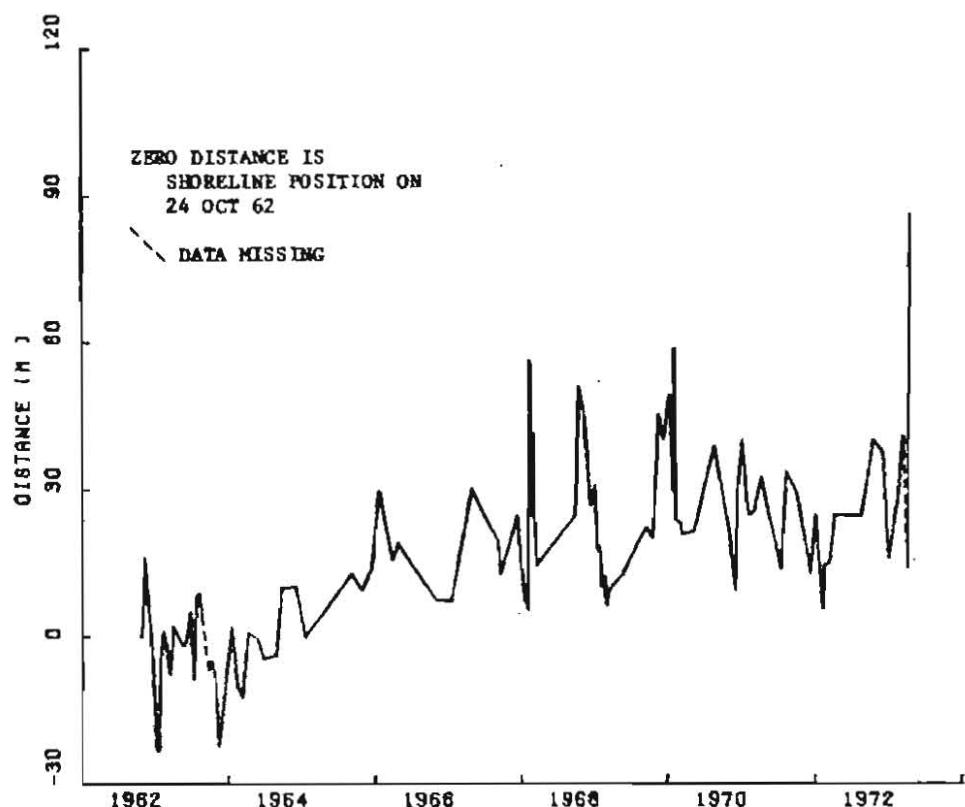
CHANGE IN DISTANCE TO MSL SHORELINE AT
PROFILE LINE 4 ATLANTIC CITY, NEW JERSEY



CHANGE IN DISTANCE TO MSL SHORELINE AT
PROFILE LINE 5 ATLANTIC CITY, NEW JERSEY



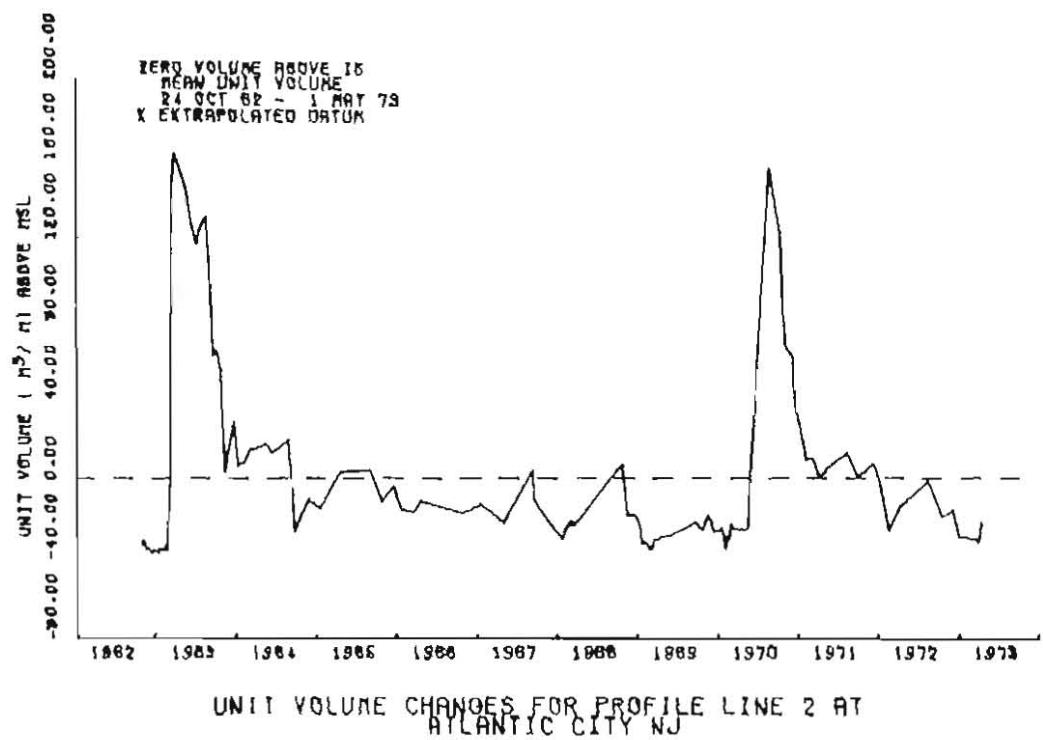
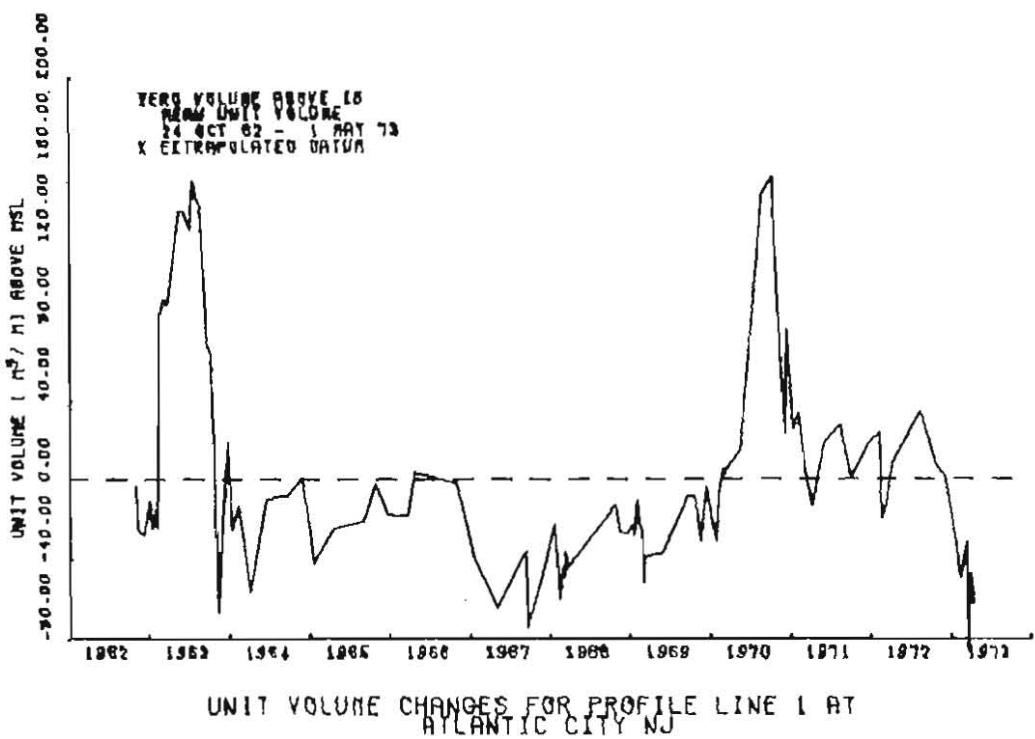
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PROFILE LINE 6 ATLANTIC CITY, NEW JERSEY

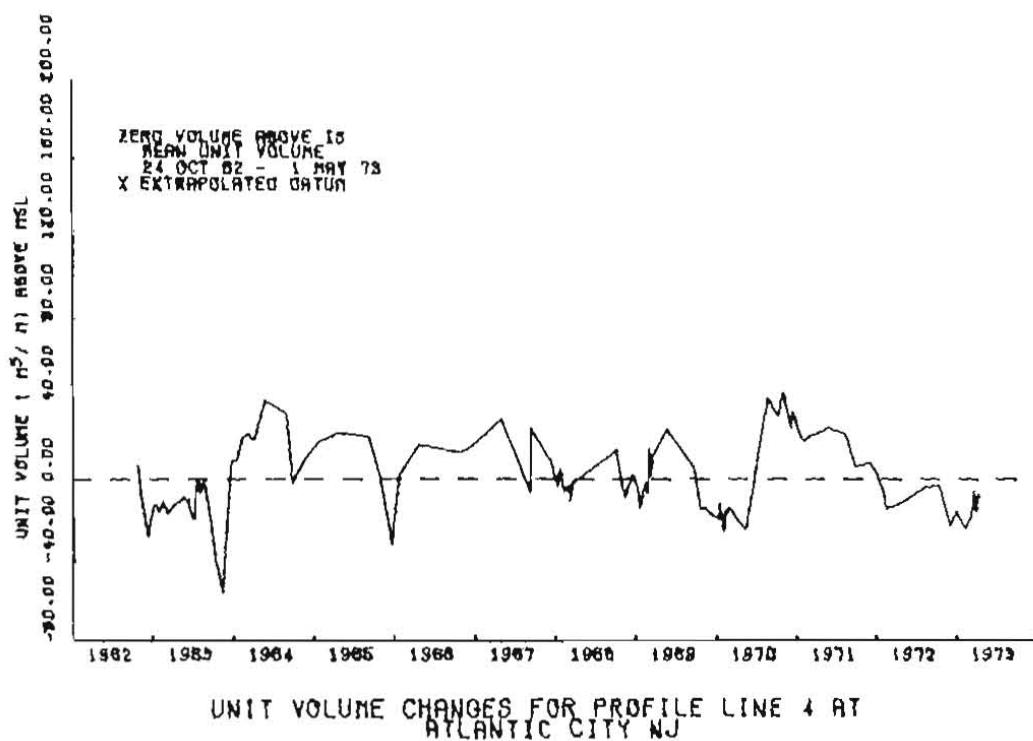
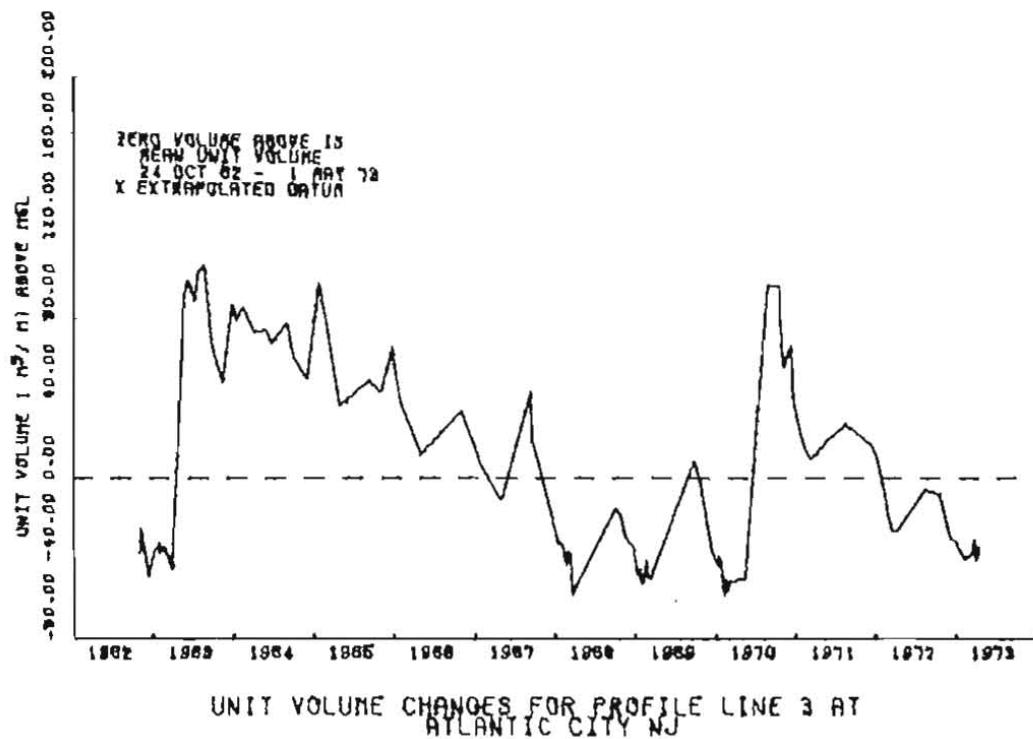


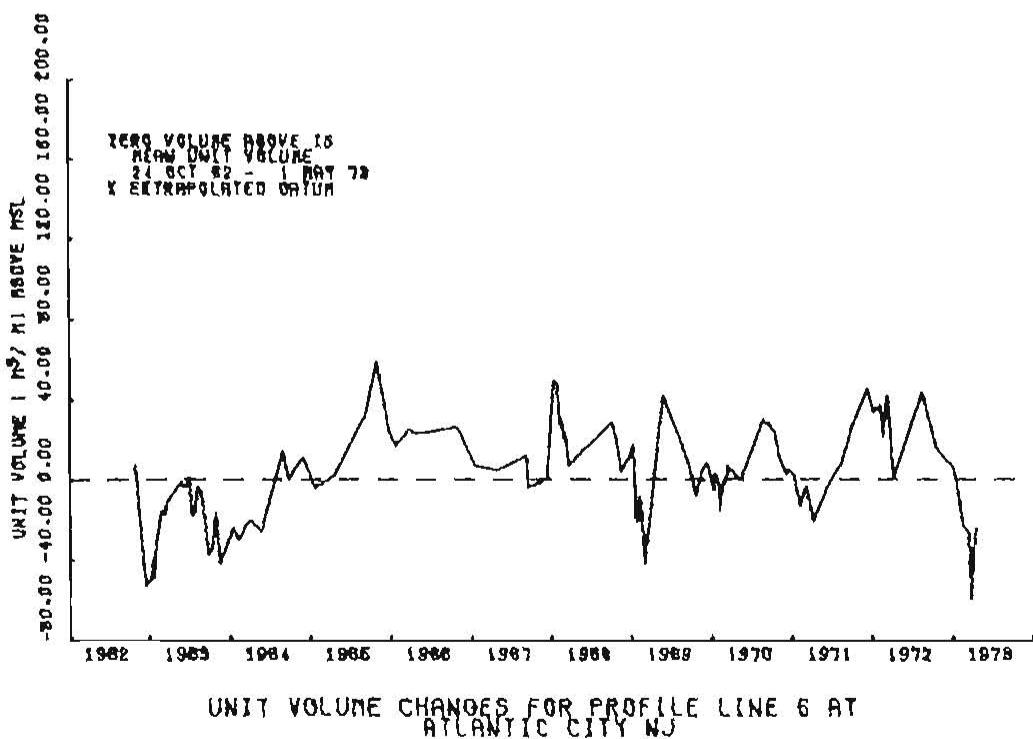
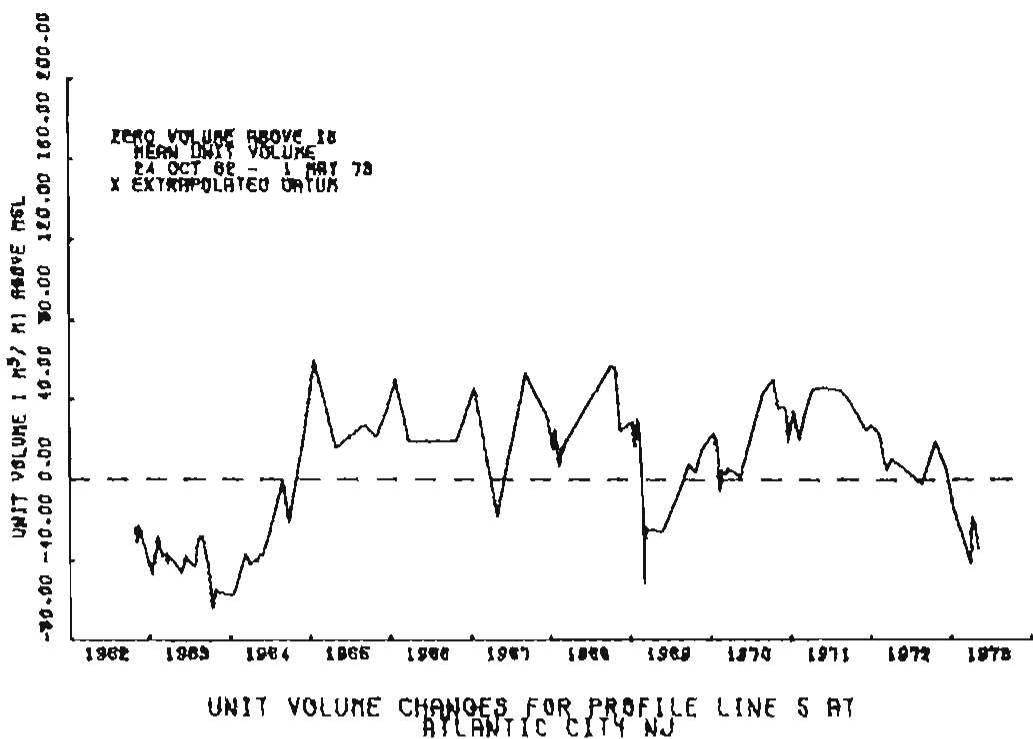
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PROFILE LINE 7 ATLANTIC CITY, NEW JERSEY

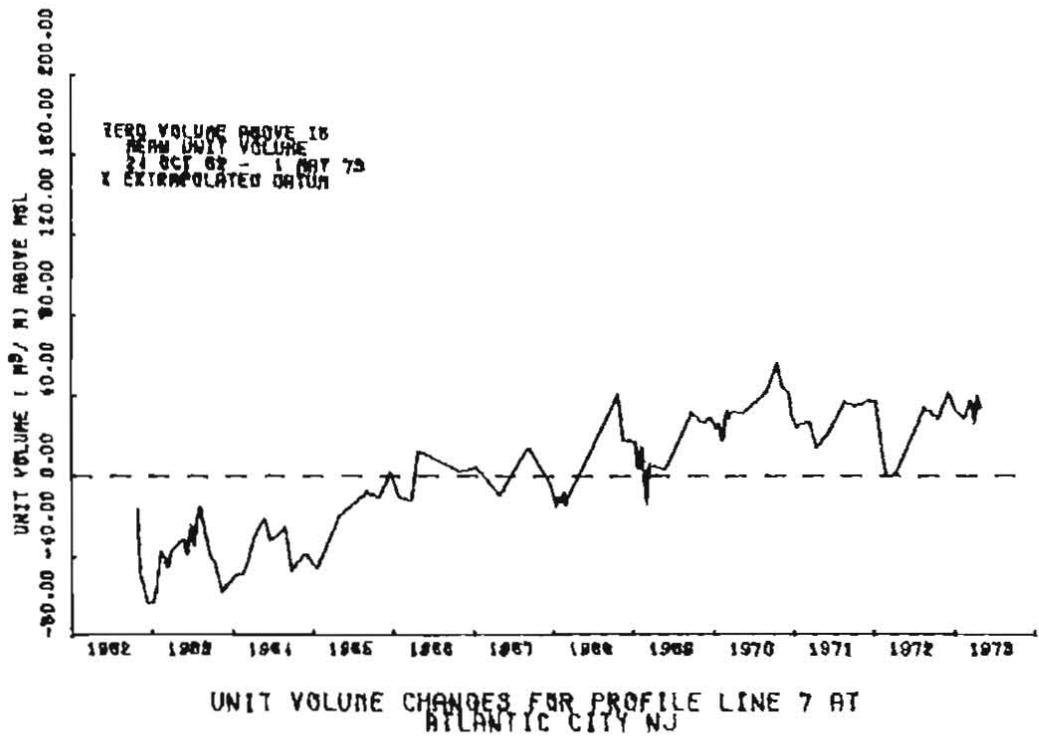
APPENDIX E

ABOVE MSL UNIT VOLUME CHANGES



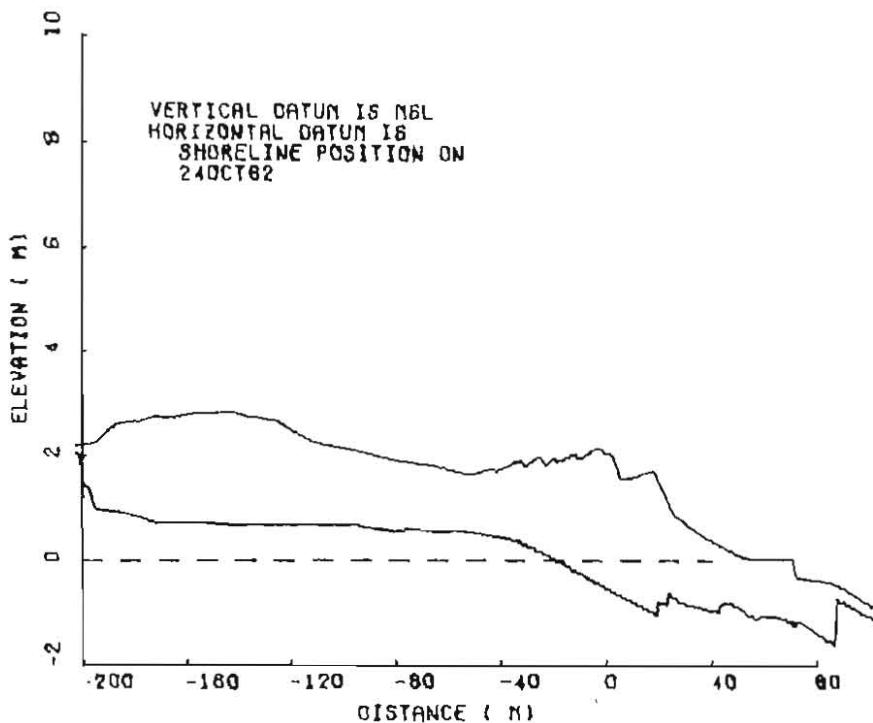




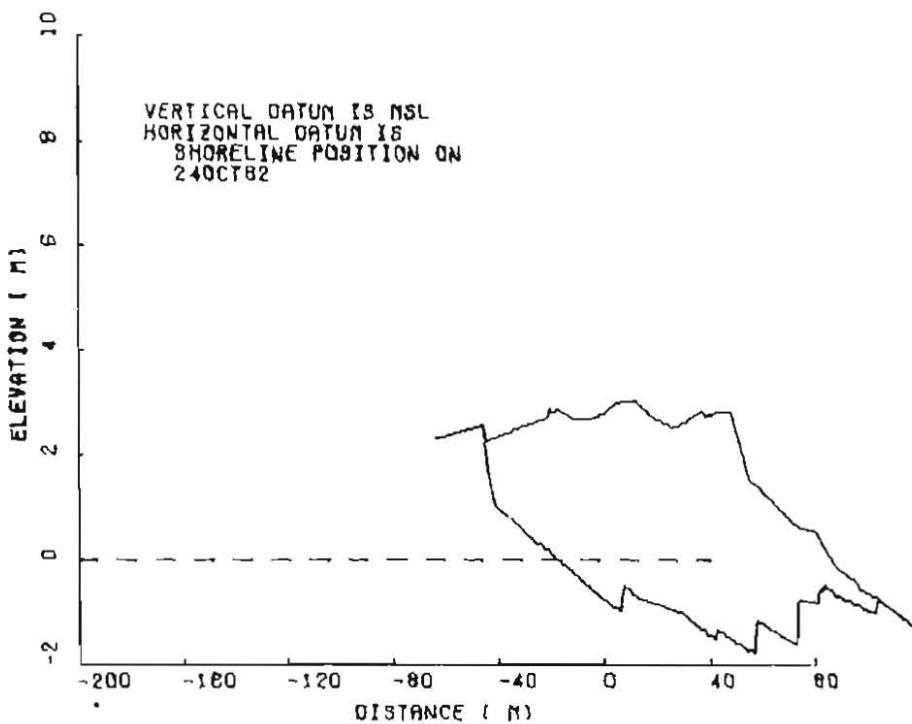


APPENDIX F

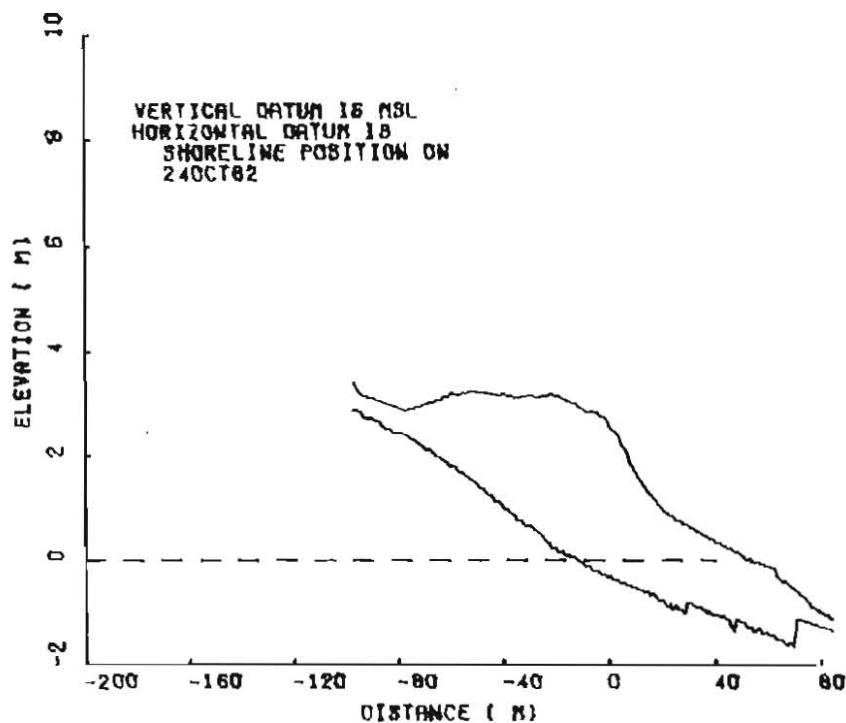
PROFILE ENVELOPES



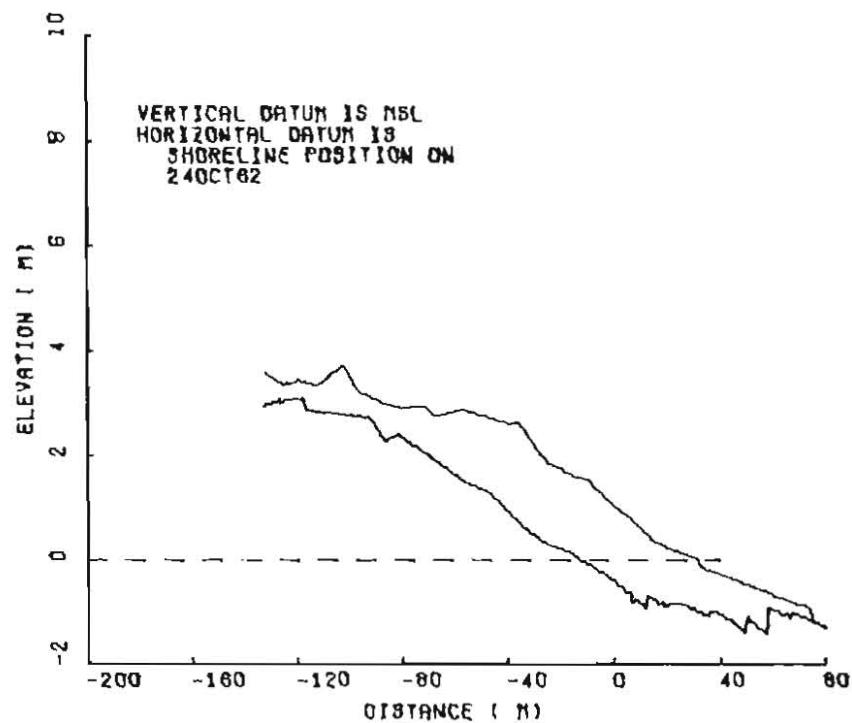
PROFILE ENVELOPE FOR PROFILE LINE 1 AT ATLANTIC CITY NJ
24OCT62 - 18APR73



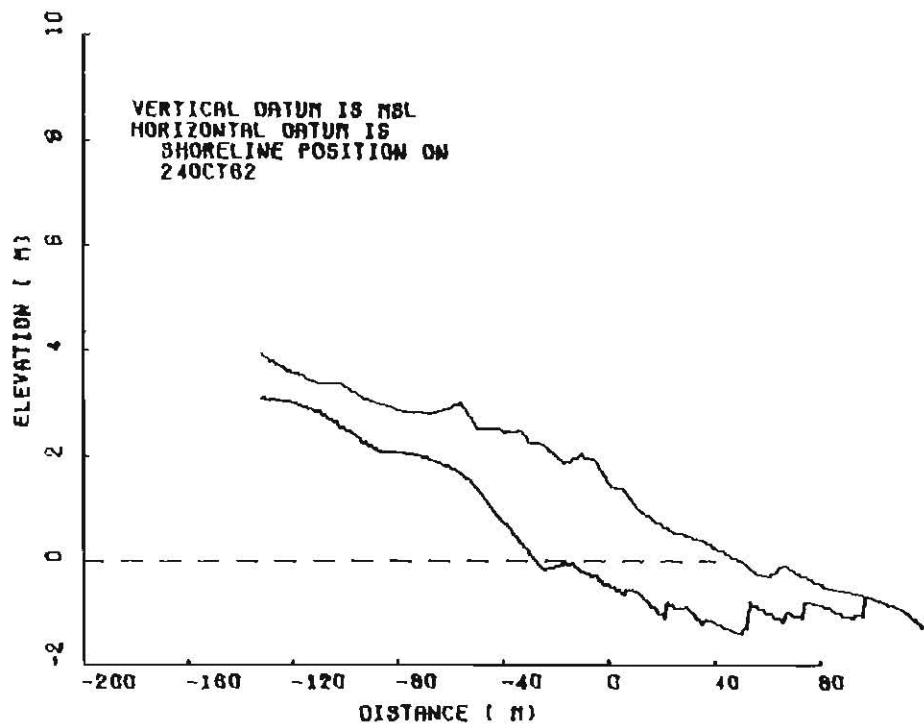
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24OCT62 - 18APR73



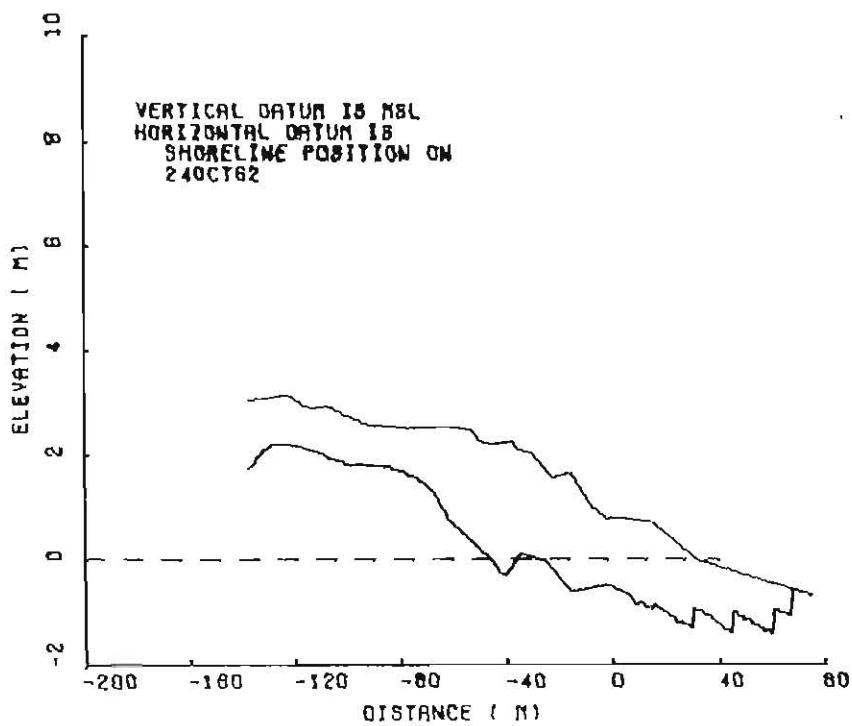
PROFILE ENVELOPE FOR PROFILE LINE 3 AT ATLANTIC CITY NJ
24OCT62 - 18APR73



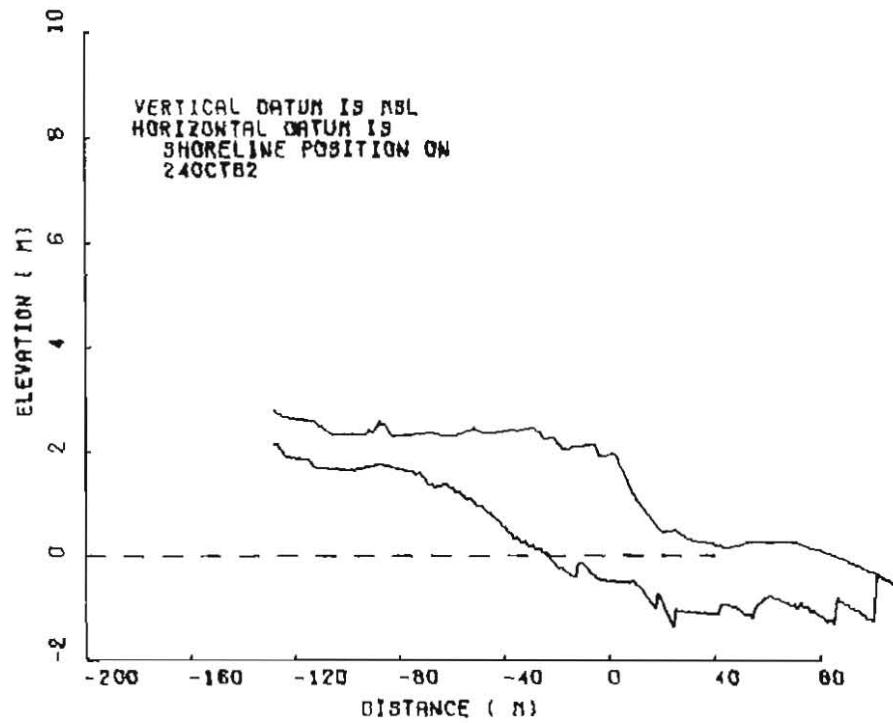
PROFILE ENVELOPE FOR PROFILE LINE 4 AT ATLANTIC CITY NJ
24OCT62 - 18APR73



PROFILE ENVELOPE FOR PROFILE LINE 5 AT ATLANTIC CITY NJ
24OCT62 - 1MAY73



PROFILE ENVELOPE FOR PROFILE LINE 6 AT ATLANTIC CITY NJ
24OCT62 - 18APR73



PROFILE ENVELOPE FOR PROFILE LINE 7 AT ATLANTIC CITY NJ
24OCT62 - 1MAY73

McCann, Dennis P.

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Cover title.

"March 1981."

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