

**University of Texas
Marine Science Institute**

**Final Report
Monitor water currents, sea levels,
temperatures, salinities, and meteorological
conditions at Aransas Pass, Texas.**

April 9, 2001

Contract No. 99-483-319

Currents, tides, and weather at the University of Texas Marine Science Institute Pier

Data submission to Texas Water Development Board by Anthony F. Amos, 31 March 2000

Data from the University of Texas Marine Science Institute's Pier over the Aransas Pass to the Gulf of Mexico is collected by various instruments deployed permanently at this facility. Data are stored in monthly files and averaged at half-hour intervals. The format of the data files is given below.

YRHR	YrMoDy	Hr	Mn	SST1	SST2	SAL1	SAL2	TURB	CSPD	CDIR	EASTC	NRTHC
4368.0	00 701	0	0	29.93	29.70	35.81	99.99	999.9	15.1	113.6	13.8	-6.0
TIDE	AIRT	Rh	BAROM	WSPD	GUST	WDIR	EASTW	NRTHW				
-0.004	28.0	100.0	1014.4	7.7	9.8	327.6	-8.0	12.6				
4368.5	00 701	0	30	29.93	29.70	35.56	99.99	999.9	7.9	154.1	3.5	-7.1
0.025	28.0	100.0	1014.4	5.6	16.7	334.9	-4.6	9.8				
4369.0	00 701	1	0	29.92	29.70	35.81	99.99	999.9	25.6	298.4	-22.6	12.2
0.071	28.1	99.9	1014.5	6.7	8.6	341.8	-4.0	12.3				

Where

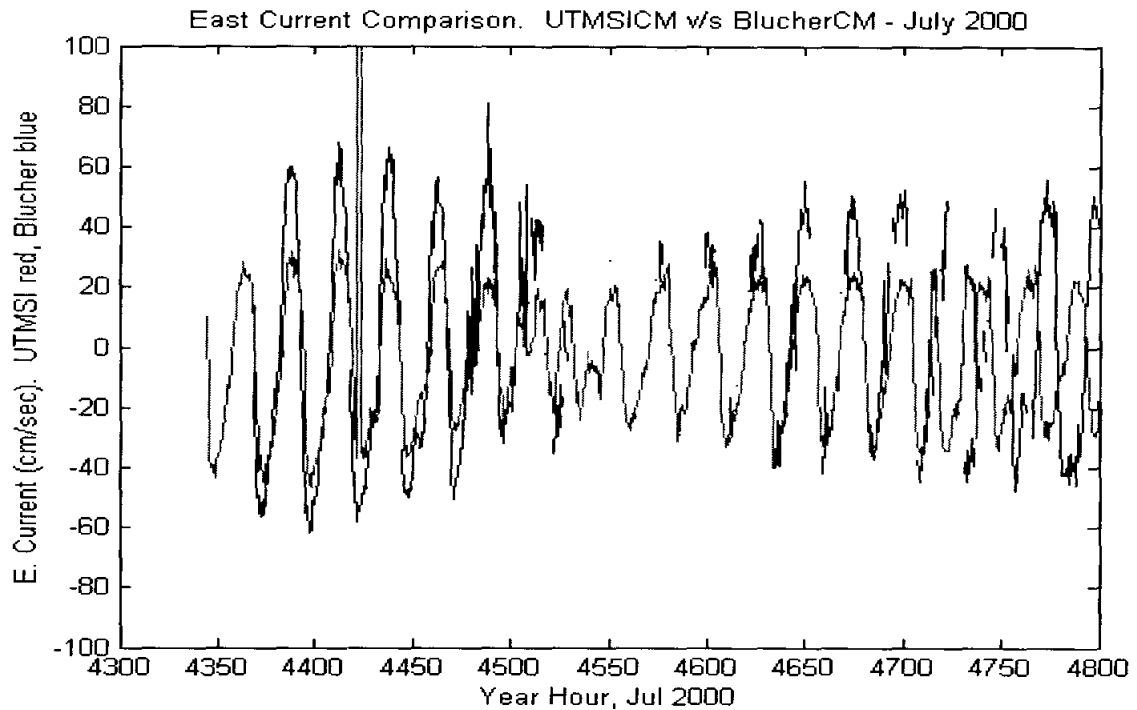
- YRHR = Hours elapsed since 1 January 2000 0000CST
- YrMoDy = Year, Month, Day
- Hr = Hour
- Mn = Minute
- SST1 = Sea Temp (C), near surface (99.99)
- SST2 = Sea temp (C), deep (99.99)
- SAL1 = Salinity (PPT) near surface (99.99)
- SAL2 = Salinity (PPT) deep (99.99)
- TURB = Turbidity (JTU) (999.9)
- CSPD = Current speed (cm/sec) (999.9)
- CDIR = Direction current flowing (degrees) (999.9)
- EASTC = East component of the current (cm/sec) (999.9)
- NRTHC = North component of the current (cm/sec) (999.9)
- TIDE = Water level relative to mean sea level (m) (99.999)
- AIRT = Air temperature (C) (99.9)
- Rh = Relative humidity (IGNORE)
- BAROM = Barometric pressure (mb) (9999.9)
- WSPD = Wind Speed (m/sec) (99.9)
- GUST = High wind gust (m/sec) (99.9)
- WDIR = Direction from which wind is blowing (degrees) (999.9)
- EASTW = East component of the wind (999.9)
- NRTHW = North component of the wind (999.9)
- (numbers in parentheses are value if data is missing or unreliable)

Note that when the month is October or later (10,11, or 12), the YrMoDy column merges into one so if the program to read the data reads in column form, space delimited, the year column becomes one with the month/day column after October. The current record has several gaps in it. After redeploying the UTMSI meter on July 26 2000, it malfunctioned and was eventually sent back to the company for repair. For the rest of the record I used the data from the Blucher Institute's SonTek ADCP, deployed at our Pier laboratory at a mean depth of 24 ft with its beams looking horizontally into the ship channel.

Figure 1

Most of the gaps occurred with no explanation, but towards the end of the year, the data became "spiky", with current speeds of up to 5m/sec recorded;

an impossibility. I had to somewhat arbitrarily truncate all data when the speed exceeded 1.25m/sec. In July, there was an overlap between the UTMSI Aanderaa meter and the Blucher Sontek. The Sontek always records higher current speeds. A comparison between the two is shown in Figure 1.



Note that the amplitude of currents recorded by the UTMSI meter is less than that recorded by the Blucher meter. The phase is identical, however (except where the UT meter started going bad near hour 4740 [around 16 July]). Note also the many gaps in the Blucher record. I am now engaged in comparing all data from 1999 with the Blucher data and will report on that later. Blucher records data as X and Y velocities, where X is the along-channel, and Y, the cross-channel component of the flow. To be compatible with previous data

collected on this project, I have calculated the true east and north components of the flow, based on a channel orientation of 305/125 degrees true.

To illustrate the coverage over the period July through December 2000, Figs 2 through 7 show the east component current v/s the tide heights. The Tide heights are referenced to Mean Sea level plus 100cm to avoid overlap with the current data that uses the same scale (cm/sec for currents, cm for tides).

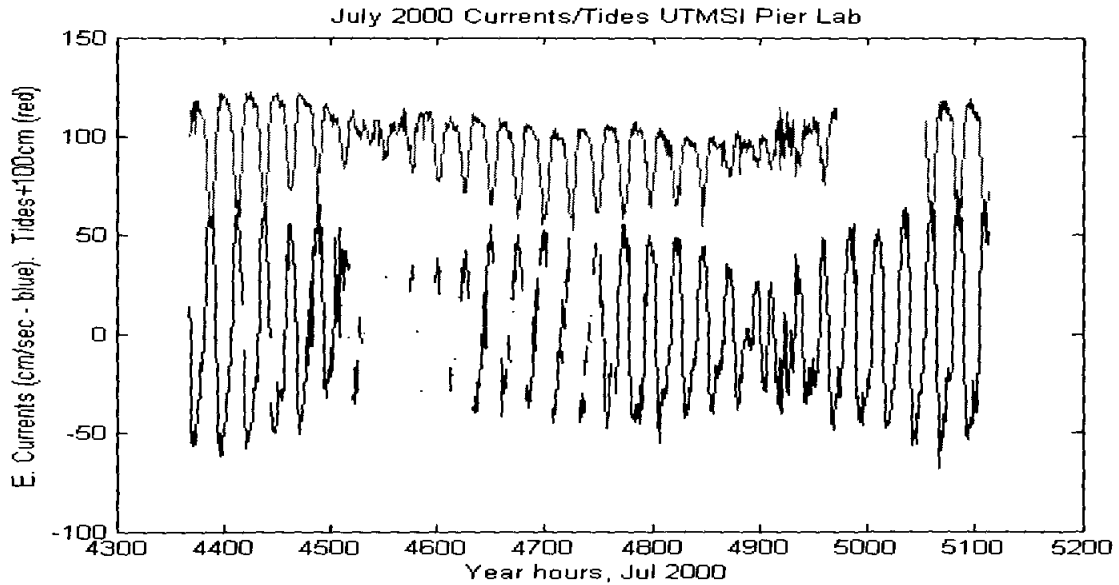


Figure 2

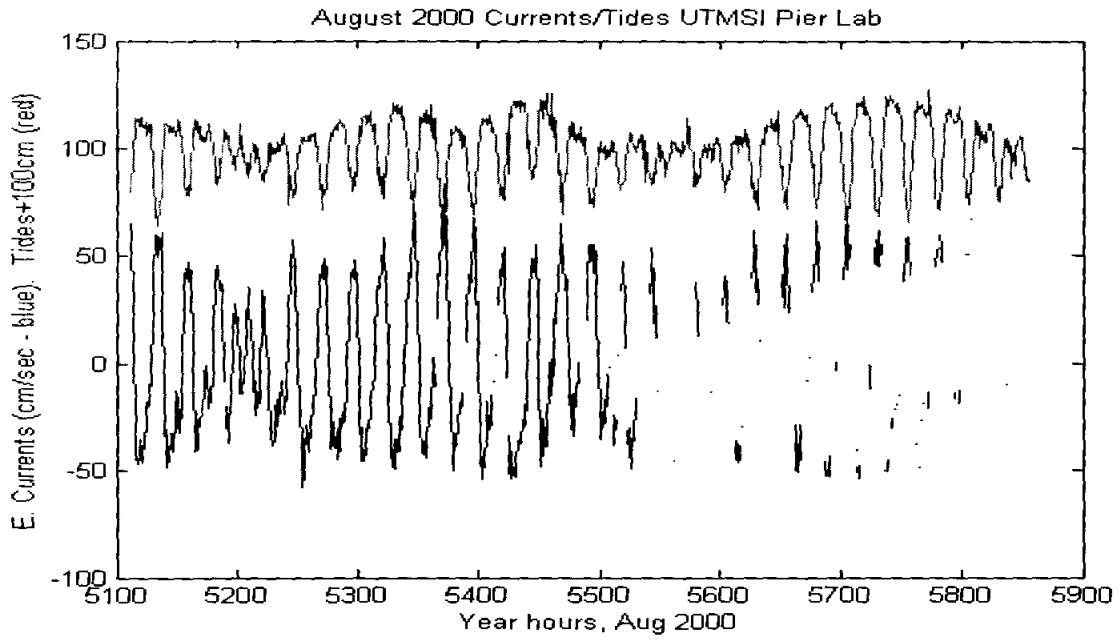


Figure 3

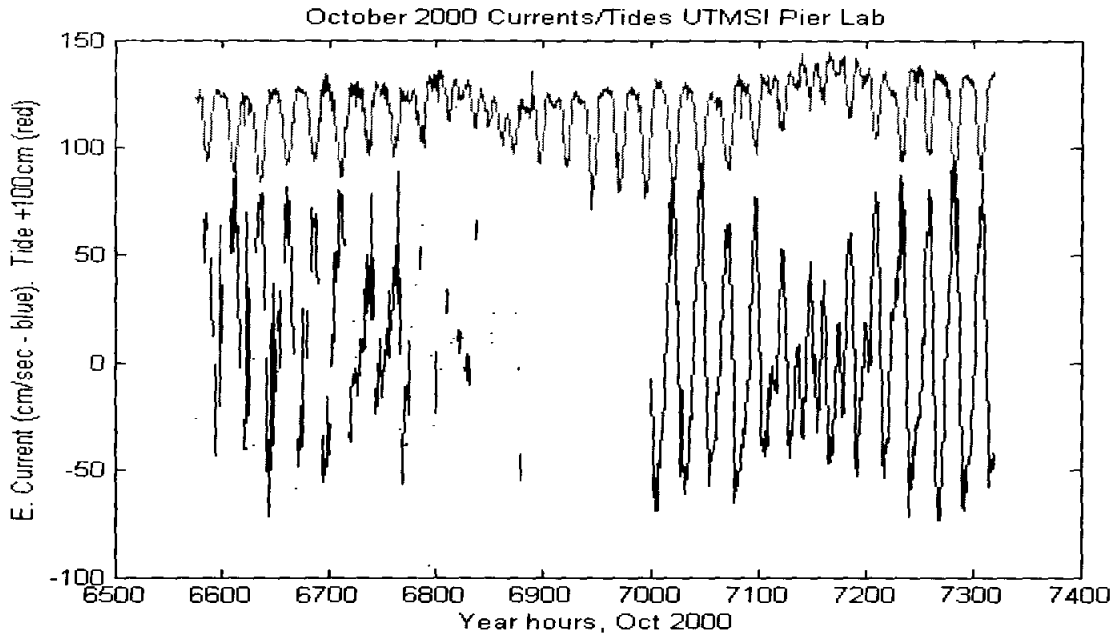


Figure 4

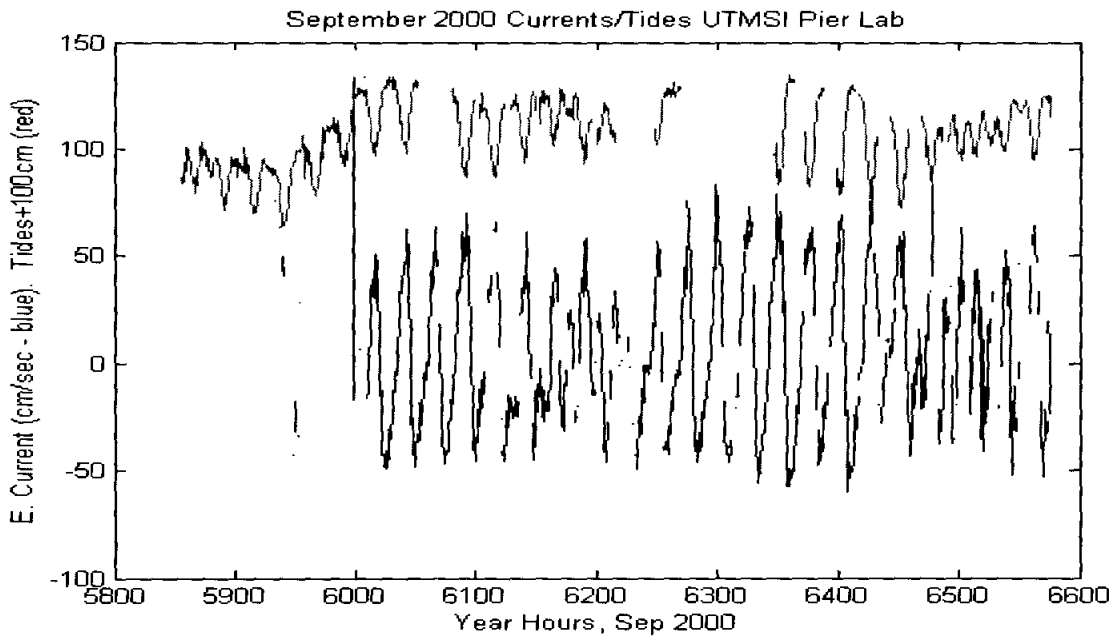


Figure 5

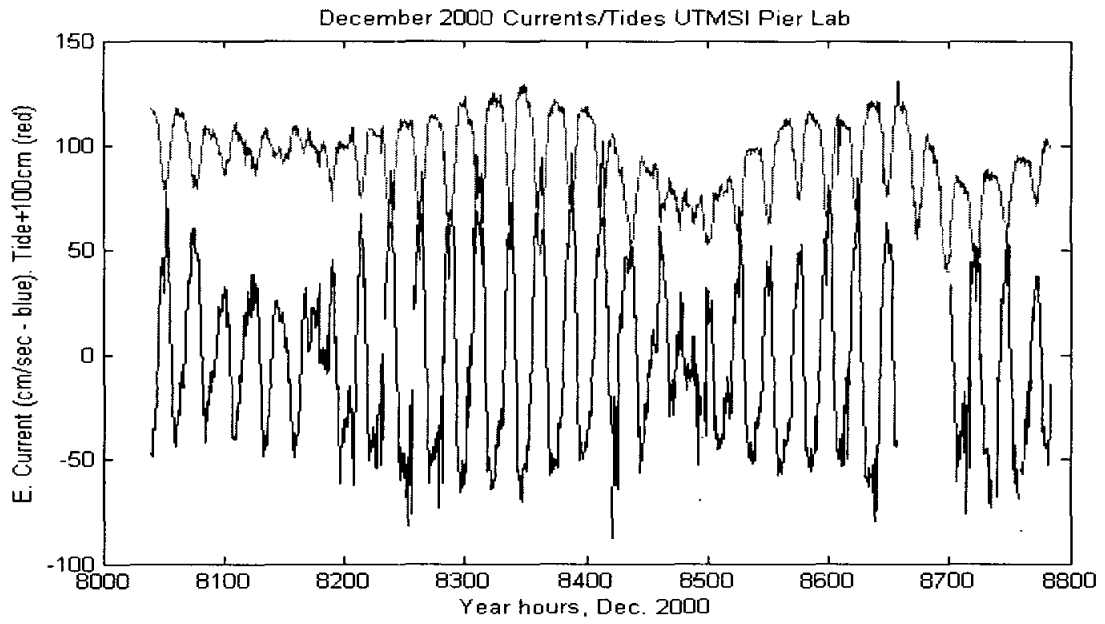


Figure 6

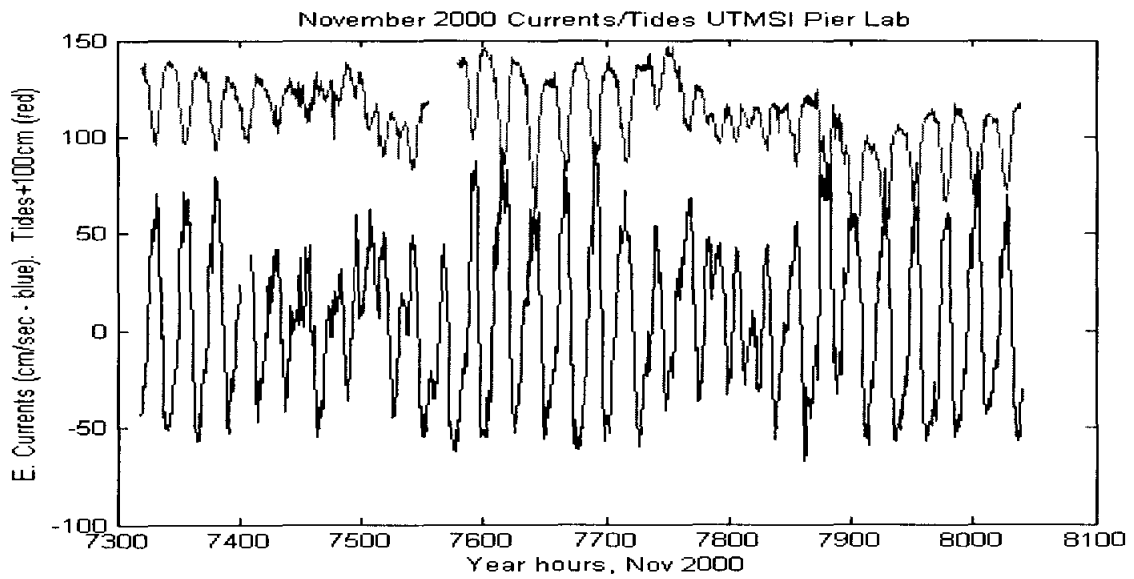


Figure 7

I have included an extra set of data files that have the MATLAB Not a Number (NaN) in columns where data are missing or suspect. The zipped file is called PCMAT00.ZIP and the unzipped files have the extension .TXT. The Zipped files with 9's in the suspect columns (PCM2000.ZIP) have the extension .HLF. In all these files (using the Blucher current meter) there will be no second salinity value, and no turbidity value. These columns are left in-place, however and are filled with NaNs or 9s

NOTE: In the .TXT files, the wind vector columns are in knots while the wind speed and gust columns are in m/sec. In the .HLF files all wind data are in m/sec.