

## Appendix 7

### Tropical Storms and Hurricanes in the Gulf of Mexico during Study Years (1983-June 2005)

The table below was compiled by studying the tracks of all tropical storms and hurricanes found in the records of the National Weather Service National Hurricane Center, NHC/TPC Archive of Past Hurricane Seasons. Maps of the storm tracks and specific information on each storm can be found on the web at: <http://www.nhc.noaa.gov/pastall.shtml>.

Year	Storm Date	Storm Names	Category	GOM Landfall Date	Landfall Location	Maximum Winds	Comments
1983	Aug 15-21	H. Alicia	Category 3	Aug 18	Galveston Island, TX	115 mph	22 killed, \$ Billion Damage, 14 ft surge
1983	Aug 23-29	H Barry		Aug 28	South of Brownsville, TX		
1984	Sept 13-15	TS Edouard	TS	NA	NA		No Landfall, very far south in GOM, likely minimal effect on South Texas
1985	Jul 21-25	H Bob		Jul. 23	Florida		
1985	Aug 11-20	H Danny		Aug 15	Louisiana		3 killed, \$1.7 mio damage
1985	Aug 27 – Sept 4	H Elena		Sept 2	Mississippi		
1985	Oct 25 – Nov 1	H Juan		Oct 29	Louisiana		
1985	Nov 15-23	H Kate		Nov 21	Florida		
1986	June 23-28	H Bonnie	Category 2	June 26	South of Port Arthur	97 mph or Maximun Sustaned Winds 85?	
1987	Aug 9-17	Unnamed	TS	Aug 10	North Texas		\$500 Million In Damage 11 Killed \$1.7 Million In Damage 13 Killed \$8.25 Million In Damage
1988	Aug 31 – Sept 5	H Debby		Sept 2	Mexico		
1988	Sept 7-11	H Florence		Sept 9			
1988	Sept 8-19	H Gilbert	Category 5	Sept 16			
1988	Nov 17-24	TS Keith	TS	Nov 23			
1989	June 24-27	TS Allison	TS	June 26			
1989	Jul 30-Aug 3	H Chantal	Category 1	Aug 1	Texas	80 mph	
1989	Oct 12-16	H Jerry	Category 1	Oct 15	Galveston, TX	85 mph	

1990	Aug 3-7	H Diana		Aug 7	Mexico		3 Killed
1990	Oct 9-13	TS Marco	TS	Oct 11	Florida		
1991	Aug 16-27	H Andrew		Aug 26	Louisiana		
1992							
1993	June 18-21	TS Arlene	TS	June 20	South Texas		
1993	Sept 14-21	H Gert		Sept 20	Mexico		
1994	Jun 30 – Jul 7	TS Alberto	TS	Jul 3			
1994	Aug 14-19	TS Beryl	TS	June 15			
1995	Jun 3-6	H Allison					
1995	July 28- Aug 02	TS Dean	TS	July 30	Freeport, TX	Maximum Sustained Winds 45	July 28-31?
1995	Jul 31-Aug 6	H Erin		Aug 3	Florida		
1995	Aug 9-12	TS Gabrielle	TS	Aug 11	Mexico		
1995	Aug 22-28	TS Jerry	TS	Aug 26			
1995	Sept 27-Oct 5	H Opal		Oct 4	Florida		
1995	Oct 7-21	H Roxanne		Oct 20	South Mexico		
1996	Aug 19-25	H Dolly		Aug 22	Mexico		
1996	Oct 4-8	TS Josephine	TS	Oct 7	Florida		caused considerable coastal flooding and beach erosion at Port A
1997	July 16-26	H Danny		July 19	Alabama		
1998	Aug 21-24	TS Charley	TS	Aug 22	Port Aransas, TX	Maximum Sustained Winds 60	Aug 22-25?
1998	Aug 31 – Sept 3	H Earl		Sept 2	Florida		
1998	Sept 8-13	TS Frances	TS	Sept 11	Port O'Connor, TX	Maximum Sustained Winds 65 With Gusts Up To 75	\$10 Million In Damage Dumped At Least 16 Inches Of Rain
1998	Sept 15 – Oct 1	H Georges		Sept 28	Mississippi		
1998	Sept 17-20	TS Hermine		Sept 19	Louisiana		
1998	Oct 22 – Nov 5	H Mitch		Nov 4	Florida		
1999	Aug 18-25	H Brett	Category 4	Aug 23	Port Mansfield, TX	Maximum Sustained Winds 140	
2000	Aug 13-15	TS Beryl	TS	Aug 14	Mexico		
2000	Sept 14-18	H Gordon		Sept 17	Florida		

2000	Sept 15-25	TS Helene	TS	Sept 22	Florida			
2000	Sept 28 Oct 6	H Keith		Oct 4	Mexico			
2001	June 5-17	TS Allison	TS	June 5	Freeport, TX	Maximum Sustained Winds 60 Gusts to 70	~\$3 Billion in Damage Dropped 36 Inches of Rain Over The Houston Area Costliest Tropical Storm On Record	
2001	Aug 2-7	TS Barry	TS	Aug 5	Florida			
2001	Sept 11-19	H Gabrielle		Sept 14	Florida			
2002	Aug 4-9	TD Bertha	TD	Aug. 9	Port Mansfield, TX	40 mph	1008 mb	
2002	Sept 1-6	TS Edouard	TS	NA	NA		Dissipated in the GOM	
2002	Sept 5-8	TS Faye	TS	Sept. 7	Palacios, TX	60 mph	998 mb	
2002	Sept 12-15	TS Hanna	TS	Sept 14	Mississippi			
2002	Sept 14-17	TS Isidore	TS	Sept 26	New Orleans			
2002	Sept 21 – Oct 4	H Lili		Oct. 3	Vermillion Bay			
2003	Jun 29 – Jul 2	TS Bill	TS	Jun 30	Louisiana			
2003	Jul 8-17	H Claudette	Category	Jul 15	Port O'Connor, TX	80 mph	982 mb	
2003	Aug 14-17	H Erika		Aug 16	Mexico			
2003	Aug 30 – Sep 2	TS Grace	TS	Aug 31	Texas			
2003	Sept 3-8	TS Henri	TS	Sept 6	Florida			
2003	Oct 1-6	TS Larry	TS	Oct 5	South Mexico			
2004	Aug 3-13	TS Bonnie	TS	Aug 12	Florida			
2004	Aug 9-14	H Charley		Aug 13	Florida			
2004	Aug 25 – Sept 8	H Frances		Sept 6	Florida			
2004	Sept 2-24	H Ivan		Sept 23	Gulf Shores, Al		Affected water levels Sept 2-24	
2004	Oct 8-10	TS Matthew	TS	Oct 10	Louisiana			
2005	June	TS Arlene	TS		Florida			

## Appendix 8

### Institutions Contacted to Obtain Near-Drowning Information

The list below includes contact numbers for Texas state and local agencies as well as contacts within the agencies with potential information on drowning incidents. A list of other useful information sources and references follows the list.



Figure. Map of Texas Coastal Counties (from TGLO).

#### **Cameron County**

Cameron County Parks (956) 761-3701

Vital Statistics; (956) 554-0817

## **Willacy County**

Willacy County Clerk  
Courthouse Building  
Raymondville, TX 78580-3533  
(956) 689-2710 or (956) 689-5300

Port Mansfield: (956) 944-4000 – Fishing Guide service

## **Kenedy County – NA**

## **Kleberg County – NA**

## **Nueces County – NA**

Vital Statistics; 851-7211  
Health Education; 851-7200  
Station 16 Fire Department; 826-4183  
CC Fire Chief; 880-3932  
Lifeguard Station; 826-4181  
Lifeguard Supervisor: administrative offices 826-3970 - Lifeguard office 826-4180 -  
Lifeguard station 16 holds records. .  
EMS: Director EMS Division Corpus Christi Fire Department (361) 826-3942 FAX (361)  
887-7385

## **Aransas County**

Aransas County Clerk  
301 North Live Oak Street  
Rockport, TX 78382-2744  
361 790-0122  
Aransas County Courthouse  
301 N Live Oak Street  
Rockport, TX 78382-2744  
361 790-0100 FAX: 361 790-0125

**Calhoun County** – Check with Brownsville for present Rip current studies

## **Matagorda County**

Matagorda County Clerk  
1700 Seventh Street Room #202  
Bay City, TX 77414-5034  
(409) 244-7680

Matagorda City Volunteer Fire Department: (979) 863-7551 – Matagorda Island is only accessible by ferry from Port O'Connor. The ferry operates to Park facilities on the island.

## **Brazoria County**

Brazoria County Clerk  
111 E. Locust, #200  
P.O. Box D  
Angleton, TX 77515-1504  
(979) 864-1359 or (979) 849-5711

### Brazoria County Courthouse

111 E. Locust  
Angleton, TX 77515  
Phone: (979) 849-5711

Surfside Beach Fire/EMS Department: (979) 233-5926  
Freeport Fire/EMS Department:  
Quintana City Information: (979) 233-0848-  
Brazoria County emergency Management: (979) 849-5711

## **Galveston County**

EMS:  
Web: <http://www.galvestonbeachpatrol.com/>

## **Chamber County**

County Clerk's Office:  
404 Washington  
P. O. Box 728 Anahuac, Texas 77514  
(409) 267-8309 ~ Fax: (409) 267-8315  
EMS: Chamber County has two access points for beaches along the Gulf Coast. These access points are in Winnie and Stowell. One Volunteer Fire Department services them. Winnie and Stowell VFD – (409) 296-4133

## **Jefferson County**

Jefferson County Clerk's Office: (409) 983-8340  
Local Fire Department: (409) 983-8700  
EMS Services - Goldstar: (409) 984 –1911 and Metrocare: (409) 729-9300

## **Other Statistical Sources:**

Texas Bureau of Vital Statistics;  
Phone: (888) 963-7111  
Web: [www.tdh.state.tx.us/bvs/](http://www.tdh.state.tx.us/bvs/)  
National Weather Service – Rip Current  
Miami WFO  
National Oceanic Atmospheric Administration – United States Lifesaving Association  
United States Lifesaving Association: <http://www.usla.org>

## Appendix 9

### Atmospheric and Surf Conditions During Nueces County Surf Incidents

Events are recorded as ND: Near Drowning, D: Drowning and PD: Possible Drowning. For weekdays, Monday =1, Tuesday = 2, etc. Incidents highlighted in gray are suspected to be duplicates. Also the exact times of the day for the incidents are possibly incorrect as they increase throughout the data set.

Date	Event	Time	Week Day	Stand	Location	Race	Sex	Age	Average Wind During Day (7AM-7PM) [mph]	Average Wind Past 24 hrs [mph]	Water Level Difference at Incident Time [m]	NDBC 42020 Wave Height at Incident Time [m]	24 hour Atmospheric Pressure Difference	Water Level Range of the day [m]	Timing with respect with tide	Tropical Storm?
5/29/1983	ND	0	7	4		NA	NA	0	NA	NA	NA	NA	NA	NA	NA	No
6/7/1983	ND	0	2	16		NA	NA	0	NA	NA	NA	NA	NA	NA	NA	No
6/12/1983	ND	10:10	7	495	Third Sandbar S. end of Access Rd 1	W	M	35	NA	NA	NA	NA	NA	NA	NA	No
6/22/1983	D	1015	3	0		W	F	55	NA	NA	NA	NA	NA	NA	NA	No
6/22/1983	D	1045	3	5		H	M	16	NA	NA	NA	NA	NA	NA	NA	No
7/2/1983	D	1045	6	11		W	M	18	NA	NA	NA	NA	NA	NA	NA	No
7/2/1983	D	1055	6	2		W	M	6	NA	NA	NA	NA	NA	NA	NA	No
7/16/1983	D	1055	6	7		W	M	18	NA	NA	NA	NA	NA	NA	NA	No
8/17/1983	ND	1112	3	12	20 S. Stand, First Gut	H	F	35	NA	NA	NA	NA	NA	NA	NA	No
8/17/1983	ND	1115	3	1	Bob Hall Pier	W	M	0	NA	NA	NA	NA	NA	NA	NA	No
8/22/1983	D	1124	1	10		W	M	22	NA	NA	NA	NA	NA	NA	NA	H
5/26/1984	D	1130	6	496	Mustang State Park	B	M	14	17.2	13.9	NA	NA	-1.1	NA	NA	No
5/28/1984	D	1130	1	15		W	M	21	17.2	16.1	NA	NA	0.8	NA	NA	No
5/28/1984	D	1140	1	7				0	17.2	16.1	NA	NA	0.8	NA	NA	No
6/2/1984	ND	1145	6	497	Surf Pier 3rd Sand	M		20	19.2	15.9	NA	NA	-1.9	NA	NA	No

					Bar												
6/2/1984	D	1150	6	7		W	M	5	19.2	15.9	NA	NA	-1.9	NA	NA	No	
6/2/1984	D	1208	6	17	350 Yds S. Of 18	W	F	32	19.2	15.9	NA	NA	-1.9	NA	NA	No	
6/10/1984	D	1208	7	18	JUST SOUTH OF STAND 50 YDS S. OF 18	W	F	32	21.7	22.1	NA	NA	0.9	NA	NA	No	
6/12/1984	D	1208	2	497		W	F	32	21.7	17	NA	NA	1.2	NA	NA	No	
6/16/1984	D	1215	6	3		W	F	2	16.9	12.7	NA	NA	-0.6	NA	NA	No	
6/21/1984	D	1215	4	3		W	F	2	16.2	14.6	NA	NA	-0.1	NA	NA	No	
6/30/1984	D	1215	6	7		W	F	2	12.3	9.4	NA	NA	-2.9	NA	NA	No	
7/5/1984	D	1215	4	7		W	F	2	12.6	13.9	NA	NA	-0.7	NA	NA	No	
7/7/1984	D	1220	6	0	Mustang Island 20 yds. N. of Surf Pier Port	H	F	44	10.9	9.2	NA	NA	1.1	NA	NA	No	
7/15/1984	ND	1225	7	0		H	F	24	12.8	12.8	NA	NA	1.6	NA	NA	No	
7/22/1984	D	1240	7	20	Aransas behind st. 11	W	M	15	6.8	7.2	NA	NA	0.6	NA	NA	No	
7/22/1984	ND	1246	7	0	Stand, 2nd gut	NA	NA	0	6.8	7.2	NA	NA	0.6	NA	NA	No	
7/22/1984	ND	1247	7	17	Stand, 2nd gut	W	F	14	6.8	7.2	NA	NA	0.6	NA	NA	No	
7/22/1984	ND	1247	7	17	Stand, 2nd gut	W	F	14	6.8	7.2	NA	NA	0.6	NA	NA	No	
7/22/1984	N	1247	7	17	NEAR DROW Stand, 2nd gut	W	F	19	6.8	7.2	NA	NA	0.6	NA	NA	No	
7/26/1984	D	1248	4	11		W	F	17	11	10.5	NA	NA	1.1	NA	NA	No	
7/28/1984	D	1248	6	11		W	F	17	9.3	8.7	NA	NA	-1.3	NA	NA	No	
7/28/1984	D	1248	6	11		W	F	17	9.3	8.7	NA	NA	-1.3	NA	NA	No	
7/28/1984	D	1248	6	11		W	F	17	9.3	8.7	NA	NA	-1.3	NA	NA	No	
7/28/1984	D	1252	6	7		W	M	20	9.3	8.7	NA	NA	-1.3	NA	NA	No	
8/2/1984	D	1255	4	6		W	M	20	9.7	11.2	NA	NA	1.3	NA	NA	No	
8/3/1984	ND	1256	5	495	Mayan Princess	W	M	3	9.7	9.6	NA	NA	2.3	NA	NA	No	



8/5/1984	D	1300	7	7		W	M	3	17.2	15	NA	NA	0.7	NA	NA	No
8/7/1984	ND	1300	2		At Stand	H	F	18	24	NA	NA	NA	-0.1	NA	NA	No
8/11/1984	D	1304	6	5		NA	NA	0	14.8	13.7	NA	NA	-0.6	NA	NA	No
8/19/1984	D	1306	7	14	50 yds N of stand 14	W	M	14	16.9	12.4	NA	NA	-2.9	NA	NA	No
8/19/1984	D	1307	7	3		W	M	10	16.9	12.4	NA	NA	-2.9	NA	NA	No
8/19/1984	ND	1315	7	18	20 Yds N	H	F	10	16.9	12.4	NA	NA	-2.9	NA	NA	No
8/19/1984	ND	1315	7	18	20 Yds N	H	F	12	16.9	12.4	NA	NA	-2.9	NA	NA	No
8/19/1984	D	1315	7	8		H	M	37	16.9	12.4	NA	NA	-2.9	NA	NA	No
					MUSTANG ST.PARK BOUNDAR											
8/19/1984	ND	1317	7	495	Y	W	M	23	16.9	12.4	NA	NA	-2.9	NA	NA	No
8/19/1984	D	1334	7	11		H	F	21	16.9	12.4	NA	NA	-2.9	NA	NA	No
					Sout Of 3 125 Yds Out											
8/19/1984	ND	1335	7	3		W	M	22	16.9	12.6	NA	NA	-2.9	NA	NA	No
8/19/1984	D	1338	7	11		NA	NA	0	16.9	12.6	NA	NA	-2.9	NA	NA	No
8/19/1984	D	1338	7	13		NA	NA	0	16.9	12.6	NA	NA	-2.9	NA	NA	No
8/19/1984	ND	1338	7	13	13	W	M	5	16.9	12.6	NA	NA	-2.9	NA	NA	No
8/19/1984	D	1338	7	12		H	F	21	16.9	12.6	NA	NA	-2.9	NA	NA	No
8/19/1984	ND	1338	7	2	10 Yds S Stand	W	M	22	16.9	12.6	NA	NA	-2.9	NA	NA	No
					By Snoopy Pier											
8/19/1984	D	1338	7	0	50 Yds S.	W	M	34	16.9	12.6	NA	NA	-2.9	NA	NA	No
8/19/1984	ND	1346	7	14	First Gut	H	F	13	16.9	12.6	NA	NA	-2.9	NA	NA	No
8/19/1984	D	1400	7	3		W	M	14	16.9	12.6	NA	NA	-2.9	NA	NA	No
					100Yds S. Of #5											
8/19/1984	ND	1403	7	14	80 Yds. S, Of #3	H	M	16	16.9	12.6	NA	NA	-2.9	NA	NA	No
8/19/1984	ND	1403	7	2		W	F	19	16.9	12.6	NA	NA	-2.9	NA	NA	No
8/19/1984	ND	1404	7	2	Stand S Of Stand	W	F	3	16.9	12.6	NA	NA	-2.9	NA	NA	No
					#20											
8/19/1984	D	1415	7	20		W	F	14	16.9	12.6	NA	NA	-2.9	NA	NA	No
8/26/1984	D	1415	7	19	200 Yds S	H	F	16	13	10.4	NA	NA	2.1	NA	NA	No

Of 20																
9/1/1984	D	1415	6	11		W	M	23	11.3	11.6	NA	NA	-0.2	NA	NA	No
9/2/1984	D	1415	7	0		W	M	35	19.2	13.8	NA	NA	-1	NA	NA	No
9/2/1984	ND	1424	7	13	Newport Pass	W	F	31	19.2	13.8	NA	NA	-1	NA	NA	No
5/25/1985	D	1425	6	1		W	M	0	7.5	8.2	NA	NA	-2.3	NA	NA	No
5/30/1985	ND	1430	4	12	Behind Stand 13	H	M	5	25.6	22.1	NA	NA	0	NA	NA	No
6/8/1985	ND	1431	6	18	Marker 15-1/2	W	F	13	10.9	8.4	NA	NA	-1.1	NA	NA	No
6/8/1985	D	1440	6	13	In front of stand 11	H	M	23	10.9	8.4	NA	NA	-1.1	NA	NA	No
6/8/1985	D	1445	6	2		W	M	35	10.9	8.4	NA	NA	-1.1	NA	NA	No
6/8/1985	D	1445	6	2		W	M	35	10.9	8.4	NA	NA	-1.1	NA	NA	No
6/8/1985	D	1445	6	3		W	M	35	10.9	8.4	NA	NA	-1.1	NA	NA	No
6/8/1985	D	1445	6	3		W	M	35	10.9	8.4	NA	NA	-1.1	NA	NA	No
6/8/1985	ND	1450	6	95	S Side Of 11, 2nd Bar	B	M	14	10.9	8.4	NA	NA	-1.1	NA	NA	No
6/8/1985	D	1455	6	3		W	F	16	10.9	8.4	NA	NA	-1.1	NA	NA	No
6/8/1985	D	1455	6	4		W	M	42	10.9	8.4	NA	NA	-1.1	NA	NA	No
6/8/1985	D	1459	6	11		W	M	25	10.9	8.4	NA	NA	-1.1	NA	NA	No
7/6/1985	D	1459	6	12		W	M	25	8.3	10.8	NA	NA	2.8	NA	NA	No
7/6/1985	D	1459	6	13		W	M	25	8.3	10.8	NA	NA	2.8	NA	NA	No
7/6/1985	D	1500	6	4		H	M	7	8.3	10.8	NA	NA	2.8	NA	NA	No
7/6/1985	D	1500	6	4		W	M	7	8.3	10.8	NA	NA	2.8	NA	NA	No
7/6/1985	D	1502	6	12				0	8.3	10.8	NA	NA	2.8	NA	NA	No
7/7/1985	D	1502	7	6	100 YDS NORTH OF STAND		M	51	6.9	5.9	NA	NA	1.5	NA	NA	No
7/13/1985	D	1512	6	1		H	M	38	16.9	13.6	NA	NA	1	NA	NA	No
7/13/1985	D	1530	6	13		W	M	8	16.9	13.6	NA	NA	0.9	NA	NA	No
7/13/1985	D	1530	6	9		W	F	14	16.9	13.6	NA	NA	0.9	NA	NA	No
7/13/1985	ND	1533	6	12	2nd Sand Bar	W	M	12	16.9	13.6	NA	NA	0.9	NA	NA	No
8/15/1985	D	1535	4	8		W	M	27	5.4	7.4	NA	NA	-2.6	NA	NA	H

8/15/1985	D	1540	4	9		W	M	0	5.4	7.4	NA	NA	-2.6	NA	NA	H
8/25/1985	ND	1542	7		At Stand		M		11.7	12.4	NA	NA	0.2	NA	NA	No
8/25/1985	ND	1545	7	11	Surf Pier	W	F	8	11.7	12.4	NA	NA	0.2	NA	NA	No
8/25/1985	D	1547	7	13	Pilings			0	11.7	12.4	NA	NA	0.2	NA	NA	No
					10 yds. N.											
					of Bath											
8/25/1985	ND	1550	7	0	House	H	F	32	11.7	12.4	NA	NA	0.2	NA	NA	No
8/25/1985	D	1551	7	2		H	M	41	11.7	12.4	NA	NA	0.2	NA	NA	No
6/14/1986	ND	1552	6	496	Stand 12	W	M	12	8.6	10.2	NA	NA	0.1	NA	NA	No
6/14/1986	D	1555	6	10		W	M	23	8.6	10.2	NA	NA	0.1	NA	NA	No
7/12/1986	D	1605	6	2		H	F	7	18.8	17.8	NA	NA	-0.1	NA	NA	No
7/12/1986	ND	1615	6	11	11	H	F	19	18.8	17.8	NA	NA	-0.1	NA	NA	No
7/12/1986	D	1615	6	6		W	M	21	18.8	17.8	NA	NA	-0.1	NA	NA	No
7/12/1986	D	1615	6	15	20yds S 15	W	M	25	18.8	17.8	NA	NA	-0.1	NA	NA	No
					Ranger											
7/26/1986	ND	1615	6		Station	H	M	33	13.8	12.9	NA	NA	-1.4	NA	NA	No
8/11/1986	D	1615	1	0		B	M	44	14	12.9	NA	NA	1.6	NA	NA	No
					3/4 mi S of											
8/13/1986	D	1640	3	18	#18	W	M	33	7.6	7.7	NA	NA	-1.6	NA	NA	No
					100 yd N											
8/13/1986	D	1645	3	11	Zahn	H	M	21	7.6	7.7	NA	NA	-1.6	NA	NA	No
8/17/1986	D	1645	7	9		W	M	25	16.7	15.9	NA	NA	1.2	NA	NA	No
5/31/1987	D	1650	7	13		N	F	21	17.3	17.1	NA	NA	0.6	NA	NA	No
6/11/1987	ND	1655	4	19	IN WATER	W	M	31	21.4	18.7	NA	NA	-1.6	NA	NA	No
6/11/1987	D	1704	4	18		W	M	33	21.4	18.7	NA	NA	-1.6	NA	NA	No
6/12/1987	D	1705	5	13		W	M	19	16.9	15	NA	NA	3.3	NA	NA	No
					Port											
6/12/1987	D	1712	5	0	Royale	W	F	4	16.9	15	NA	NA	3.3	NA	NA	No
6/12/1988	ND	1714	7	14	N Of Stand	H	F	24	17.4	15.5	NA	NA	-2.1	NA	NA	No
6/19/1988	D	1715	7	8				0	11.9	11.9	NA	NA	2	NA	NA	No
7/8/1988	D	1715	5	11				0	8	8.2	NA	NA	-0.5	NA	NA	No
					75 yds. S.											
7/23/1988	ND	1718	6	0	of St. 9	W	F	41	13.7	11.6	NA	NA	-0.8	NA	NA	No

5/23/1990	D	1727	3	7		W	M	34	10	11	NA	NA	-0.3	NA	NA	No
5/28/1990	D	1730	1	12				0	20.9	18.6	NA	1.3	-0.4	NA	NA	No
6/2/1990	ND	1730	6	16		W	M	6	31.1	25.4	NA	2.6	2.3	NA	NA	No
6/2/1990	D	1735	6	7		W	M	26	31.1	25.4	NA	2.6	2.3	NA	NA	No
5/26/1991	D	1736	7	3				0	7.9	9.1	0.24	0.5	-0.6	0.72	down	No
5/26/1991	D	1736	7	2		H	M	16	7.9	9.1	0.24	0.5	-0.6	0.72	down	No
5/26/1991	D	1740	7	11		W	F	7	7.9	9.1	0.24	0.5	-0.6	0.72	down	No
5/26/1991	D	1740	7	11		W	F	7	7.9	9.1	0.24	0.5	-0.6	0.72	down	No
5/27/1991	D	1740	1	11		W	F	7	13.2	10.2	0.16	0.6	2.6	0.66	down	No
5/29/1991	D	1740	3	11		W	F	7	20.2	16.6	0.15	1.3	-1.6	0.64	down	No
6/8/1991	ND	1745	6	13	25 Yds N/2nd Gut	W	F	7	12.9	12.2	0.49	0.9	-1.1	0.58	bot	No
6/9/1991	D	1745	7	10		W	M	26	20.6	16	0.36	NA	-0.2	0.77	down	No
6/15/1991	D	1800	6	8		W	F	0	21.8	18	0.18	1.2	-0.7	0.63	down	No
7/8/1991	D	1800	1	2		H	F	7	NA	NA	0	NA	NA	0.74	bot	No
7/22/1991	D	1802	1	95		W	M	0	NA	NA	0.06	NA	NA	0.6	down	No
8/25/1991	D	1805	7	4		W	M	0	12.3	12.9	-0.01	0.6	0.8	0.32	down	H
9/9/1991	ND	1805	1	16	North Of Zahn			0	19.1	17.8	0.05	1.2	-0.1	0.3	top	No
5/25/1992	D	1809	1	0		H	F	34	16.9	12.5	0.02	0.7	-2.9	0.27	bot	No
5/30/1992	D	1815	6	19		H	F	34	15.5	14.9	0.07	0.8	3.9	0.73	down	No
5/30/1992	D	1825	6	5		W	M	32	15.5	14.9	0.07	0.8	3.9	0.73	down	No
7/4/1992	D	1826	6	5		W	M	0	13.2	13.2	-0.1	1.5	4.9	0.4	not defined	No
7/24/1992	D	1830	5	11		W	M	21	15.7	14.9	0.08	0.8	1.1	0.55	bot	No
5/28/1993	D	1835	5	10		W	F	28	12.5	11.8	0.15	1	NA	0.29	bot	No
5/30/1993	D	1835	7	10		W	F	28	12.9	11.8	0.12	0.8	NA	0.34	bot	No
5/30/1993	D	1835	7	10		W	F	28	12.9	11.8	0.12	0.8	NA	0.34	bot	No
6/6/1993	D	1835	7	10		W	F	28	24.3	20.5	0	1.4	NA	0.61	down	No
6/6/1993	D	1835	7	10		W	F	29	24.3	20.5	0	1.4	NA	0.61	down	No
6/7/1993	D	1835	1	10		W	F	29	25.3	21.1	0	1.8	NA	0.56	down	No
6/14/1993	D	1835	1	10		W	F	29	11.1	9.6	0.03	0.9	NA	0.37	bot	No
6/14/1993	D	1835	1	10		W	F	29	11.1	9.6	0	0.9	NA	0.37	bot	No

6/19/1993	D	1835	6	10		W	M	30	NA	NA	0.68	3.7	NA		TS	
6/19/1993	D	1835	6	10		W	M	30	NA	NA	0.68	3.7	NA	0.83	down	TS
6/30/1993	D	1835	3	10		W	M	30	25.2	21.7	0.04	1.8	NA	0.67	bot	No
7/24/1993	D	1835	6	10		W	M	30	22.2	19.7	-0.7	NA	NA	0.3	up	No
7/24/1993	D	1835	6	10		W	M	43	22.2	19.7	-0.7	NA	NA	0.3	up	No
7/24/1993	D	1835	6	10		W	M	43	22.2	19.7	-0.7	NA	NA	0.3	up	No
3/26/1994	D	1835	6	10		W	M	43	16.3	15.5	0.1	1.1	-9.1	0.43	down	No
5/27/1995	D	1835	6	10		W	M	43	19.6	16.1	0.05	1.4	-2.4	0.6	down	No
5/27/1995	D	1835	6	17	30 yds N. of Avenue G.	W	M	68	19.6	16.1	0.05	1.4	-2.4	0.6	down	No
5/27/1995	D	1850	6	2	150 N#3 496-100 N#3	H	M	12	19.6	16.1	0.05	1.4	-2.4	0.6	down	No
5/27/1995	D	1850	6	2		H	M	15	19.6	16.1	0.05	1.4	-2.4	0.6	down	No
5/27/1995	D	1923	6	6		H	M	28	19.6	16.1	0.05	1.4	-2.4	0.6	down	No
5/29/1995	D	1923	1	6		H	M	28	16.6	15.2	0.16	1.3	3.4	0.68	down	No
5/29/1995	D	1923	1	6		H	M	28	16.6	15.2	0.16	1.3	3.4	0.68	down	No
5/29/1995	D	1923	1	6		H	M	28	16.6	15.2	0.16	1.3	3.4	0.68	down	No
6/6/1995	D	1923	2	6		H	M	28	22.7	17.1	0.09	1.6	-4.5	0.22	up	H
6/15/1995	D	1923	4	6		H	M	28	17.4	13.7	0.04	0.8	-0.6	0.62	down	No
7/1/1995	D	1923	6	6		H	M	28	8.7	11.5	0.07	0.9	1.7	0.44	top	No
7/15/1995	D	1923	6	6		H	M	28	8.1	7.9	0.14	0.6	0.2	0.47	top	No
7/23/1995	D	1923	7	6		H	M	28	22.6	20	-0.06	1.9	-1.6	0.52	bot	No
4/27/2001	D	1935	5	6		H	M	28	14.9	15	0.04	1.45	-1.3	0.68	down	No
6/9/2001	D	2005	6		Marker 205	H	M	33	NA	NA	-0.06	1.04	NA	0.64	down	TS
6/9/2001	D	2005	6		Marker 205		M	33	NA	NA	-0.06	1.04	NA	0.64	down	TS

## Appendix 10

### Atmospheric and Surf Conditions During Cameron County Surf Incidents

Events are recorded as SD: Swimmer in Distress, ND: Near Drowning, D: Drowning and PD: Possible Drowning, Locations are recorded as IBP: Isla Blanca Park, BA5: Beach Access 5, BA2 Beach Access 2, NJ: Next to Jetties. For weekdays, Monday =1, Tuesday = 2, etc.

Date	Event	Week Day	Time	Location	Average Wind During Day [mph]	Average Wind Day + Past 24 hrs [mph]	Water Level Difference at Incident Time [m]	NDBC 42020 Wave Height at Incident Time [m]	24 hour Atm. Pressure Difference [mb]	Tidal Range of the day [m]	Timing with respect with tide	Tropical Storm?
4/21/2001	SD	6	14:55	IBP	16.6	19.9	-0.089	2.02	1.2	0.23	top	No
5/20/2001	SD	7	19:20	IBP	21.4	12.3	0.021	1.43	-6.4	0.32	bot	No
5/21/2001	SD	1	9:25	IBP	10.1	20.3	0.051	1.66	-2.4	0.4	top	No
6/25/2001	SD	1	18:45	IBP	6.7	8.0	-0.009	0.7	0.2	0.48	down	No
8/4/2001	SD	6	17:51	BA5	9.1	6.2	0.129	1.33	-0.7	0.41	down	TS
8/4/2001	SD	6	19:28	BA5	9.1	6.2	0.107	1.4	-0.9	0.41	down	TS
8/5/2001	SD	7	16:13	BA5	9.5	6.3	0.127	0.85	0.8	0.39	down	TS
8/12/2001	SD	7	20:00	BA5	13.2	16.9	-0.063	0.92	1.4	0.3	up	No
8/12/2001	SD	7	18:15	IBP	13.2	16.9	-0.063	0.97	1.4	0.3	bot	No
8/22/2001	SD	3	18:25	BA5	6.8	7.5	0.058	1.15	0.7	0.18	top	No
3/20/2002	SD	3	12:27	IBP	17.0	14.8	0.003	1.46	8.3	0.43	top	No
3/31/2002	SD	7	12:57	IBP	14.9	13.7	-0.023	1.65	10.2	0.53	top	No
4/1/2002	SD	1	16:51	IBP	3.2	9.4	-0.081	1.23	-2.7	0.46	down	No
4/27/2002	SD	6	12:41	IBP	18.7	6.8		2.23	-4			No
5/19/2002	SD	7	17:41	IBP	14.6	15.8	0.162	1.75	1.8	0.4	down	No
5/21/2002	SD	2	14:28	IBP	8.4	7.6	0.230	1.39	-1	0.26	top	No
5/21/2002	SD	2	19:21	IBP	8.4	7.6	0.172	1.82	-1.6	0.27	down	No
5/26/2002	SD	7	14:00	IBP	7.8	13.1	0.066	1.12	1.2	0.66	down	No
5/26/2002	SD	7	16:00	IBP	7.8	13.1	0.083	1.13	1.2	0.66	down	No
5/26/2002	SD	7	16:00	IBP	7.8	13.1	0.083			0.66	down	No
5/27/2002	SD	1	13:30	IBP	18.9	11.4	0.108	1.52	-3.2	0.69	down	No

5/27/2002	SD	1	16:48	IBP	18.9	11.4	0.091	1.51	-3.2	0.69	down	No
6/2/2002	ND	7	18:00	BA5	6.7	8.7	0.211	0.63	-0.9	0.26	down	No
6/4/2002	ND	2	16:15	IBP	14.4	17.4	0.178	1.58	0.8	0.16	down	No
6/5/2002	SD	3	15:35	IBP	8.9	12.1	0.229	0.91	1	0.21	down	No
6/5/2002	SD	3	15:50	IBP	8.9	12.1	0.204	0.92	1.3	0.21	down	No
6/9/2002	SD	7	14:45	IBP	17.2	15.9	0.131	1.55	-1.4	0.53	down	No
6/12/2002	SD	3	16:49	IBP	10.0	12.6	0.162	1.09	0.6	0.68	down	No
6/12/2002	SD	3	19:03	IBP	10.0	12.6	0.183	1.03	0.5	0.7	down	No
6/12/2002	SD	3	19:03	IBP	10.0	12.6	0.183			0.7	down	No
6/20/2002	SD	4	16:51	NJ	10.6	15.8	0.106	1.78	5	0.41	down	No
6/21/2002	SD	5	14:35	IBP	9.7	8.9	0.120	1.51	1.4	0.47	down	No
6/21/2002	SD	5	18:16	IBP	9.7	8.9	0.107	1.48	0.5	0.52	bot	No
6/22/2002	SD	6	14:33	IBP	10.2	5.6	0.218	1.05	-1.3	0.5	down	No
6/23/2002	SD	7	11:13	IBP	7.9	6.7	0.167	0.92	-2.4	0.58	down	No
7/2/2002	ND	2	15:00	IBP	21.8	18.5	0.071	1.72	-1.1	0.17	down	No
7/4/2002	SD	4	15:52	IBP	17.0	20.5	0.058	1.78	0.8	0.24	down	No
7/6/2002	SD	6	15:40	IBP	9.6	10.6	0.009	0.8	0.4	0.48	down	No
7/7/2002	SD	7	12:22	BA5	10.1	6.6	0.003	0.33	0	0.51	down	No
7/7/2002	SD	7	18:09	BA5	10.1	6.6	0.007	0.47	-0.5	0.61	bot	No
7/13/2002	SD	6	13:37	BA5	17.7	12.1	0.110	0.86	-1.7	0.53	top	No
7/14/2002	SD	7	17:58	IBP	15.9	16.4	0.064	1	3.2	0.36	top	No
7/15/2002	SD	1	14:09	IBP	20.0	15.8	0.050	1.49	0.4	0.3	down	No
7/22/2002	SD	1	18:34	IBP	5.5	11.2	0.037	0.91	1.4	0.61	down	No
				1/2 mile								
7/28/2002	D	7	12:58	N BA5	18.1	14.9	0.056	1.86	0.7	0.29	top	No
7/28/2002	SD	7	16:02	IBP	18.1	14.9	0.035	1.57	0.8	0.21	top	No
7/30/2002	SD	2	16:01	IBP	11.7	13.9	-0.004	1.02	2.5	0.13	bot	No
8/11/2002	SD	7	9:56	IBP	3.2	4.8	0.292	0.96	-0.6	0.4	top	No
8/11/2002	SD	7	14:23	IBP	3.2	4.8	0.258	0.96	0.1	0.31	top	No
8/17/2002	SD	6	13:38	BA5	13.1	12.6	0.077	1.1	0.6	0.55	down	No
9/1/2002	SD	7	19:35	IBP	12.6	6.5	0.106	0.95	-1.4	0.43	up	TS
9/2/2002	SD	1	14:26	BA5	7.5	7.1	0.116	0.72	-3	0.46	down	TS
9/15/2002	SD	7	16:44	IBP	12.4	8.0	0.200	1.47	3.8	0.5	bot	TS
12/21/2002	SD	6	12:30	IBP	22.0	9.9	-0.273	2.71	-11.3	0.64	up	No
3/18/2003	SD	2	11:34	BA5	16.6	8.0	0.259	0.91	-5.6	0.06	down	No
4/16/2003	SD	3	17:01	BA5	10.0	16.2	0.000	1.29	-2.5	0.16	top	No

5/11/2003	SD	7	14:31	IBP	5.5	14.8		1.99	5.7	0.54	up	No
3/3/2004	ND	3	13:01	IBP	6.5	7.4	-0.066	1.44	-2.4	0.54	up	No
3/12/2004	SD	5	15:45	IBP	9.1	7.2	-0.137	1.3	-3.1	0.49	top	No
4/18/2004	SD	7	16:30	IBP	7.9	4.4	0.013	0.95	1.6	0.62	down	No
4/24/2004	SD	6	17:30	BA5	6.2	7.6	-0.023	1.82	2.2	0.45	down	No
5/17/2004	D	1	4:07	IBP	10.8	8.1	0.159	0.82	-0.3	0.36	top	No
5/23/2004	D	7	17:26	IBP	17.4	18.7	0.048	1.92	-1	0.49	down	No
5/24/2004	SD	1	7:16	IBP	18.7	16.2	0.063	1.57	1.5	0.48	up	No
5/29/2004	SD	6	13:45	BA5	18.3	6.9	0.058	1.67	-3.3	0.19	down	No
5/29/2004	SD	6	19:38	IBP	18.3	6.9	0.030	1.76	-4.7	0.19	bot	No
5/31/2004	SD	1	14:00	BA5	16.0	18.3	0.069	1.74	3.1	0.46	down	No
6/8/2004	SD	2	12:29	IBP	18.3	4.7	-0.058	2.56	-0.1	0.42	top	No
6/12/2004	D	6	18:11	BA5	7.2	7.0	0.082	1.42	1.5	0.22	bot	No
7/27/2004	SD	2	5:35	IBP	4.9	5.3	0.003	0.57	-0.8	0.56	top	No
7/27/2004	PD	2	13:50	IBP	4.9	5.3	0.016	0.45	-1.9	0.56	down	No
8/9/2004	SD	1	13:00	IBP	5.8	6.0	-0.053	0.59	2.4	0.4	down	No
8/11/2004	SD	3	13:48	BA2	7.0	6.2	-0.007	0.58	-1.6	0.49	down	No
8/15/2004	SD	7	9:30	IBP	10.8	7.2	0.079	1.49	0.1	0.47	top	H
9/15/2004	SD	3	9:23	IBP	3.6	6.2	0.119	4.51	-1.1	0.32	bot	H
9/26/2004	SD	7	15:55	IBP	7.2	9.2	0.225	1.33	-1.7	0.37	down	No
<b>Averages:</b>					11.5 mph	10.8 mph	0.075 m	1.34 m	-0.13 mb	0.42 m		
<b>Standard Deviations:</b>					5.1 mph	4.5 mph	0.101 m	0.61 m	3.0 mb	0.16 m		