



**Electronic Enhancements to the Texas Coastal Ocean
Observation Network**

**Cycle 11
Contract #07-005-5**

**Final Report:
December 2007**

**Prepared for
Coastal Management Program
Texas General Land Office
Austin, Texas**

Division of Nearshore Research



Texas A&M University-Corpus Christi

The Island University

TABLE OF CONTENTS

1. Preface	3
2. General Criteria	4
3. CMP Project Review: October 2007 – December 2007	5
4. Financial Summary	6
Local Match Expenditures	
Third Party Match Expenditures	7
5. Financial Report	8
Appendix A:	9
List of Texas Coastal Ocean Observation Network stations that have been upgraded using the new Data Collection Systems purchased under CMP Cycle 11.	
Appendix B:	
Map	10
Appendix C:	
Capital Equipment	11

Preface

In 1989 the Texas A&M University-Corpus Christi commenced the installation of a modern state-of-the-art water level measurement system along the Texas coast. Following a Texas Legislative mandate in 1991, this network of water level gauges became the Texas Coastal Ocean Observation Network (TCOON). TCOON has been established in cooperation with the Texas General Land Office, the Texas Water Development Board, the U.S. Army Corps of Engineers, Lamar University-Beaumont, and the National Oceanic and Atmospheric Administration (NOAA). The network utilizes the Next Generation Water Level Measurement System developed by NOAA's National Ocean Service (NOS) for the National Water Level Observation Network. Water level data, along with other environmental parameters, are made available in near real-time via UHF packet radio, cellular telephone, and the Geostationary Operational Environmental Satellite (GOES). The TCOON system has been installed using the NOAA-NOS criteria for guidance.

Presently data are being received from thirty-four (34) gauges. This includes seven long-term gauges established and operated by NOS. NOS guidance has been utilized to obtain reliable water level data and to address legal concerns for the admissibility of the data for the determination of littoral boundaries. Most stations provide additional data such as wind speed and direction, air temperature, and water temperature, and some stations (under separate contract) provide water current, salinity, pH, and dissolved oxygen data.

The intended primary use of the data was to establish tidal datums, but TCOON is providing data for other uses including for the commercial shipping industry, recreational boaters, sailors and windsurfers, the shrimping and fishing industry, marine construction, and decision-makers responsible for marine safety and emergency evacuation in the event of an approaching hurricane. Real-time data sensors monitoring water level, wind speed and direction, and water current speed and direction, offer the ability to effectively prevent oil spill due to adverse environmental conditions and, in the event of a spill, to effectively manage response and clean up.

All the stations in TCOON collect data at six-minute intervals (0.1 hours). In order to manage this large volume of data, a database management system has been developed and continues to be improved. An Intel based workstation running UNIX is responsible for collecting, archiving, and decoding all source data received from the remote platforms. The data are supplied to sponsors and the public via the Internet at <http://lighthouse.tamucc.edu> and through voice telephone response systems.

There are many users of TCOON data, which is available over the Internet. Internet traffic records show the data is accessed most intensely during periods of tropical storm and hurricane warnings. The data is now a critical real-time tool used for emergency evacuation planning and high water level forecasting. The data is also sought by staff from NOAA's National Hurricane Center for benchmarking storms and testing storm surge models in an effort to better predict and prepare for storm surges.

The implementation of the TCOON data collection platforms over the past 15 years has utilized electronic systems designed in the 1980. The life expectancy of these systems was stated by the manufacture at 20 years. Over the last 3-4 years the TCOON has experienced data loss due to equipment failures. At the time of the submission of this Grant Application, the manufacture no longer

supported repairs of the components that make up the data collection packages. In fact, components required for repairs were no longer manufactured. With the impending loss of large amounts of data, the National Ocean Service contracted to the same manufacture to design a new data collection system. This new system is now in production and has been accepted and approved by NOAA and the National Ocean Service. The purpose of seeking the CMP grant in Cycle 11 was for the acquisition of new data collection systems to upgrade and enhance the TCOON. Utilizing CMP funding, the Division of Nearshore Research has ordered 15 new data collection systems and numerous other components that will upgrade and greatly enhance the collection of environmental data along the entire Texas Gulf Coast.

General Criteria

The outcome of the project will be to continued data collection and access to vital water level data during a tropical storm or hurricane events as well as year round data collection. The data will also be available to NOAA scientists currently researching storm surge models for better storm surge preparedness and evacuation strategies. These new real-time data collection systems will also greatly enhance the ability of Emergency Operation Officials in accessing high water elevations with respect to evacuation requirements.

The project strengthens existing project sponsored by the Texas General Land Office, Texas Water Development Board, US National Ocean Service, and US Army Corps of Engineers.

CMP PROJECT REVIEW

1. Introduction

This documents reports on the activities of the Division of Nearshore Research (DNR), Texas A&M University-Corpus Christ for the Electronic Enhancements to the Texas Coastal Ocean Observation Network.

DNR acknowledges the cooperation and assistance provided by NOS of the National Oceanic and Atmospheric Administration (NOAA). NOS operates the National Water Level Observation Network (NWLON). Seven NWLON stations are located in Texas and are included as part of TCOON; NOS contracts DNR through TGLO to perform emergency and annual maintenance on these stations. All NOS NWLON stations have been upgraded to the new data collection systems at this time. All stations in TCOON are established, maintained, and operated according to NOS guidance and standards. NOS data processing procedures form the basis for all analysis and data processing used by TCOON systems. DNR also acknowledges the technical assistance and guidance of Mr. Doug Martin, formerly of NOS, in overseeing TCOON operations and maintaining the TCOON to high standards.

2. Electronic Enhancements to the Texas Coastal Ocean Observation Network

All of the 15 new Sutron XDark systems ordered and received have been installed and are operational. A list of stations that have already been upgraded are located in Appendix A at the end of this document. In addition to the new data collection systems, components such as IP modems (for data retrieval), enclosures (to provide weather protections), backup water level sensors (redundancy), as well as other replacement and new sensors have been received and installed at stations that have been upgraded.

3. Final Financial Summary - to follow under separate cover pending reconciliation for Federal Expenditures and Cost Sharing Match Expenditures.

APPENDIX A

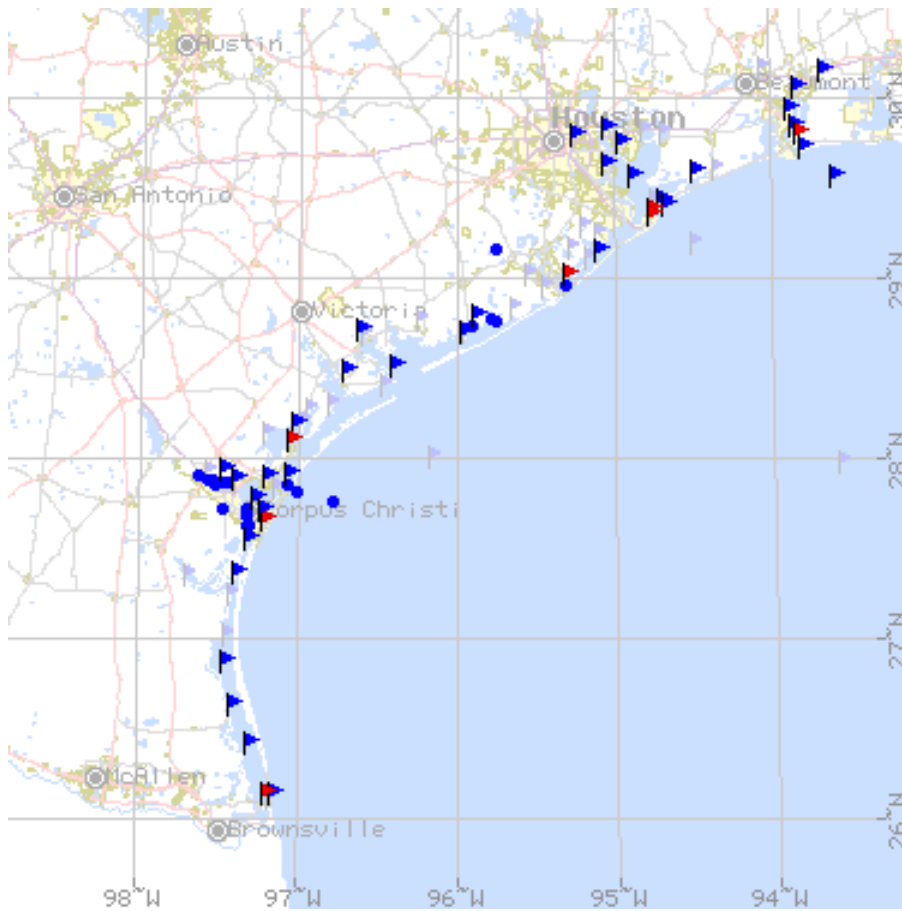
List of stations

DNR	Name	Field ID	Location ID
003	Rincon Del San Jone	87778121	26° 48.090' N 97° 28.236' W
005	Packery Channel	87757921	27.6341,97.2370 gps
009	Port Aransas	87752371	27.8398,97.0726 gps
013	S. Bird Island	87761391	27.4847,97.3181 gps
017	Port Mansfield	87784901	26.5595,97.4247 gps
031	Seadrift	87730371	28.4073,96.7122 gps
033	Port Lavaca	87732591	28.6404,96.6097 gps
057	Port O'Connor	87737011	28.4460,96.3960 est
068	Baffin Bay	87766041	27.2953,97.4050 est
126	Texas Point	87708221	29.6783,93.8372 est
153	Viola Turning Basin	87752221	28° 56.599' N 95° 18.150' W
502	Clear Lake	87709331	29.5633,95.0667 est
518	Rollover Pass	87709711	29.5150,94.5133 est
522	Galveston South Jetty	87714161	29.3267,94.6917 est
524	Port Arthur	87704751	29.8672,93.9310 gps
526	San Luis Pass	87719721	29° 4.542' N 95° 7.354' W

Appendix B

MAP AND LIST OF STATIONS

Blue flags Active TCOON stations
Red flags Active NOS stations
Blue dots Inactive stations



Financial Report

FEDERAL EXPENDITURES				
FINAL 2008				
	Current Local	Estimated Expenditures this Invoice	Amount Previously Submitted	Amount Remaining
Personnel	\$0.00	\$0.00	\$0.00	\$0.00
Benefits	\$0.00	\$0.00	\$0.00	\$0.00
Supplies	\$77,292.00	\$7,999.54	\$72,575.12	(\$3,282.66)
Equipment	\$0.00	\$0.00	\$0.00	\$0.00
Contractual**	\$117,618.00	\$0.00	\$117,618.00	\$0.00
Other	\$0.00	\$0.00	\$0.00	\$0.00
Subtotal	\$194,910.00	\$7,999.54	\$190,193.12	(\$3,282.66)
Indirect Costs	\$0.00	\$0.00	\$0.00	\$0.00
LESS OVERAGE		(\$3,282.66)		\$3,282.66
Totals	\$194,910.00	\$4,716.88	\$190,193.12	\$0.00

Cost Sharing Match

Final Period FY08

Budget Category	Local Amount Budgeted	Expenditures this Submission	Amount Previously Submitted	Amount Remaining
Personnel	\$ 60,600.00	\$ 2,479.66	\$ 81,689.40	\$ (23,569.06)
Fringe	\$ 17,574.00	\$ 719.10	\$ 24,660.69	\$ (7,805.79)
Travel	\$ 39,072.00	\$ 1,991.32	\$ 4,469.19	\$ 32,611.49
Supplies/Other	\$ 12,427.00	\$ 1,194.00	\$ 10,395.66	\$ 837.34
Equipment	\$ -	\$ -	\$ -	\$ -
Contractual	\$ -	\$ -	\$ -	\$ -
Subtotal	\$ 129,673.00	\$ 6,384.08	\$ 121,214.94	\$ 2,073.98
Indirect Costs	\$ 9,090.00	\$ 104.00	\$ 11,092.16	\$ (2,106.16)
				\$ -
Totals	\$ 138,763.00	\$ 6,488.08	\$ 132,307.10	\$ (32.18)



SUTRON CORPORATION
 21500 Ridestop Circle, Sterling, VA 20166
 Phone: 703-406-2800, Fax: 703-406-2801
 www.sutron.com

To: James Blinn
 Attn: Texas A&M
 Phone: 281 825 5751
 Fax: 361 553 5704
 Email: jblinn@earthlink.net
 Subject: Oceantrak

Prepared by:
 Sharon Holdsworth
 shah@sworld.com
 Date: 20 Nov 06
 No of Pages: 1
 Reference: D6DCA-214 Rev B
 Valid: 90 Days

Item	Part Number	Description	Unit Price	Qty	Total
1	3101-0090-2	Redundant Gauge includes Xpert without Display (Xdark), & Camera, SetlineA and 1 each Analog and Digital IO Module	\$ 7,680	10	\$ 76,800
2	3102-0090-1	Hydrographic Gauge includes Xite with PCMCIA and Ballast	\$ 4,420	9	\$ 39,780
3	SL2-G312-1	Sattrak2 HDR Satellite Transmitter/Logger	\$ 5,260	7	\$ 36,820
4	6100-0404	Aquatrak Controller	\$ 2,603	15	\$ 39,045
5	5800-0100-1	Pressure Sensor, Barometric, RS-232 and SDI-12	\$ 770	19	\$ 14,730
6	1311-1006	Protector Case, Bulkhead, NF-NF, 125-1000MHz	\$ 1,066	15	\$ 15,990
7	6411-1525-24	Cable, DB9M to DESP. 24"	\$ 275	15	\$ 4,125
Total					\$ 170,745





SUTRON CORPORATION
 AN ISO 9001 CERTIFIED COMPANY
 21300 RIDGETOP CIRCLE
 STERLING, VIRGINIA 20166
 (703) 406-2800 - FAX: (703) 406-2801
 www.sutron.com

PACKING SLIP

Original

TEXAS A&M UNIVERSITY
 TAMU-CC FISCAL AFFAIRS
 5300 OCEAN DRIVE
 UNIT 5733
 CORPUS CHRISTI, TX 78412

Delivery Address
 TEXAS A&M UNIVERSITY
 TAMU-CC CENTRAL RECEIVING
 PHYSICAL PLANT
 6300 OCEAN DRIVE, UNIT 5872
 CORPUS CHRISTI, TX 78412

Customer Ref. # 0700004
 Order Date: 02 21 07

Shipping Date: 02 21 07
 Packing Slip: 8189

Ordered: Shipped: Unit: Back Order:

Sales Order: 104183
 Order Date: 02 20 2006
 Your Ref.: 0700004

0 11-1000-0 10.000 16.000 ea

REORDER LINE STATUS

BTR SERIAL COMBINATIONS
 DO NOT INCLUDE THE SERIAL NUMBER 1000-0100-1
 CUSTOMER DOES NOT REQUIRE IT

00004 QTY	1.000 ea
00005	1.000
00001	1.000
00006	1.000
00008	1.000
00009	1.000
00010	1.000
00011	1.000
00012	1.000
00013	1.000
00014	1.000
00015	1.000
00016	1.000
00017	1.000
00018	1.000
00019	1.000
00020	1.000
00021	1.000
00022	1.000
00023	1.000
00024	1.000
00025	1.000
00026	1.000
00027	1.000
00028	1.000
00029	1.000
00030	1.000
00031	1.000
00032	1.000
00033	1.000
00034	1.000
00035	1.000
00036	1.000
00037	1.000
00038	1.000
00039	1.000
00040	1.000
00041	1.000
00042	1.000
00043	1.000
00044	1.000
00045	1.000
00046	1.000
00047	1.000
00048	1.000
00049	1.000
00050	1.000
00051	1.000
00052	1.000
00053	1.000
00054	1.000
00055	1.000
00056	1.000
00057	1.000
00058	1.000
00059	1.000
00060	1.000
00061	1.000
00062	1.000
00063	1.000
00064	1.000
00065	1.000
00066	1.000
00067	1.000
00068	1.000
00069	1.000
00070	1.000
00071	1.000
00072	1.000
00073	1.000
00074	1.000
00075	1.000
00076	1.000
00077	1.000
00078	1.000
00079	1.000
00080	1.000
00081	1.000
00082	1.000
00083	1.000
00084	1.000
00085	1.000
00086	1.000
00087	1.000
00088	1.000
00089	1.000
00090	1.000
00091	1.000
00092	1.000
00093	1.000
00094	1.000
00095	1.000
00096	1.000
00097	1.000
00098	1.000
00099	1.000
00100	1.000

0 11-1000-0 15.000 15.000 ea

REORDER LINE STATUS

Shipping Information:

Number of Boxes:

Ball of Carton:

This page intentionally left blank