

4.9 Wetlands

Texas Cooperative Extension (TCE) was subcontracted by the Environmental Institute of Houston under the Status and Trends contract to examine wetland loss in the Galveston Bay area. TCE received technical assistance from the Texas A&M University Spatial Sciences Laboratory to evaluate the loss of wetlands due to development over a 7 year period—1992-1999 for the western part of the Bay (portions of Brazoria, Galveston, and Harris counties), and from 1992 to 1995 for Chambers County.

A portion of the report is included below. The full report and associated data files produced by TCE and the Texas A&M University Spatial Sciences Laboratory can be downloaded from the Status and Trends FTP site at <ftp://trendstat.eih.ci.uh.edu>.

As seen in Figure 4.9.1, the wetlands analysis study area was comprised of 37 U.S. Geological Survey 7.5 minute quadrangles—Stowell on the Northeast and Christmas Point on the southwest excluding the Bay.

Figure 4.9.1. The TCE wetlands analysis study area

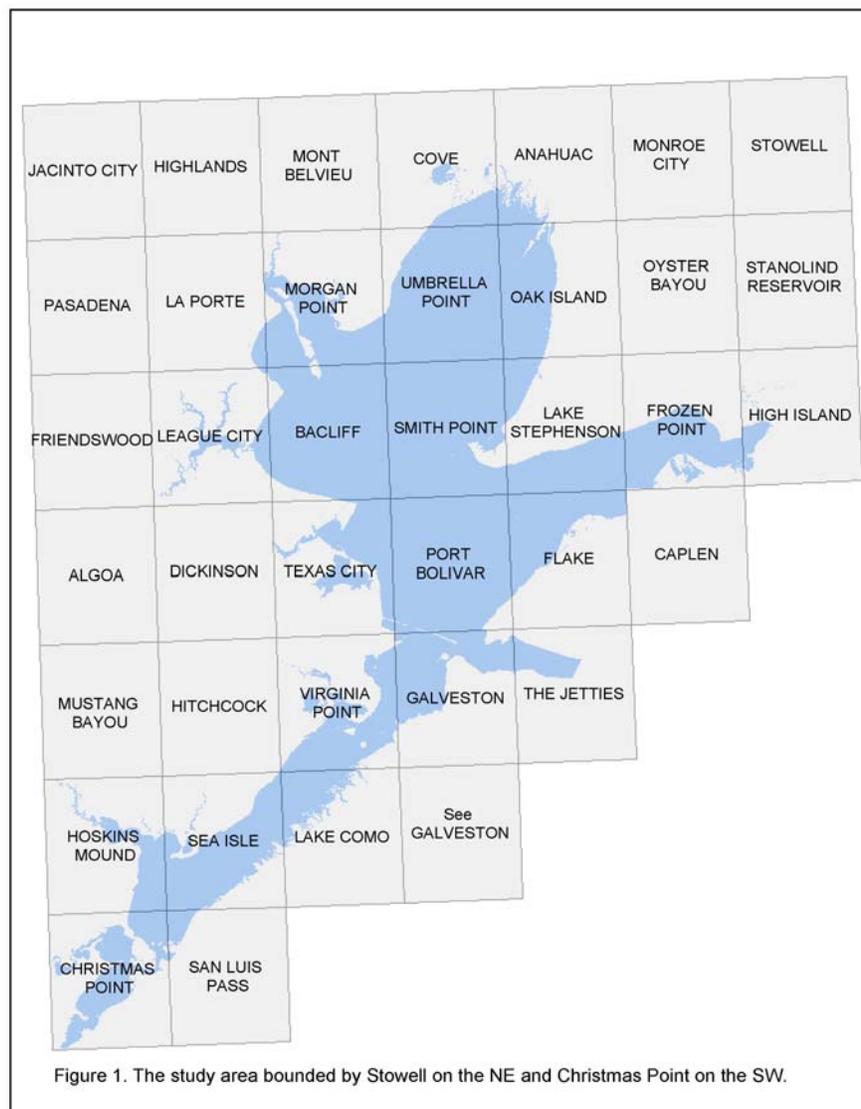


Figure 1. The study area bounded by Stowell on the NE and Christmas Point on the SW.

The 1992 National Wetland Inventories (NWIs) were used as the basis for comparison in the study. By comparing the 1992 NWIs to the reference data (at the most 7 years later), the amount of wetland loss with respect to the NWIs could be determined. Reference data included ½ meter Lamberts (flown between January 1999 and January 2000) used for the portion of the study area covered by Galveston and Harris Counties. Because ½ meter Lamberts were not available for Chambers County, digital ortho quarterquads (DOQs) served as the reference data for that portion of the study area.

To determine the amount of wetland loss, the NWIs were overlaid on their corresponding Lambert photographs (or DOQs for Chambers County). Each NWI was evaluated for any wetlands that had been developed. The analysis of wetland loss was constrained to losses from development and did not include losses to subsidence or coastline erosion. The original NWI boundary lines in shoreline areas were not always consistent with the photography available to the researchers, and trying to differentiate a potential loss of wetlands from a slightly inaccurate boundary was beyond the scope of the project.

The losses reported herein are therefore confined to natural palustrine wetlands, and excluded development that destroyed artificial wetlands (e.g., ponds and tanks). Analysis was performed on the study area to determine the amount of natural palustrine wetlands loss—this includes total number of acres, and percentage of total wetlands lost to development.

Table 4.9.1 shows the final results by each of the 37 quadrangles analyzed as part of this project. From 1992, the date of the NWI maps, and the latest date of available photography for the study area (mainly January of 1999), a total of 512 acres of palustrine wetlands as mapped by NWI in the study area were shown to be destroyed by development, or 0.3% of the total.

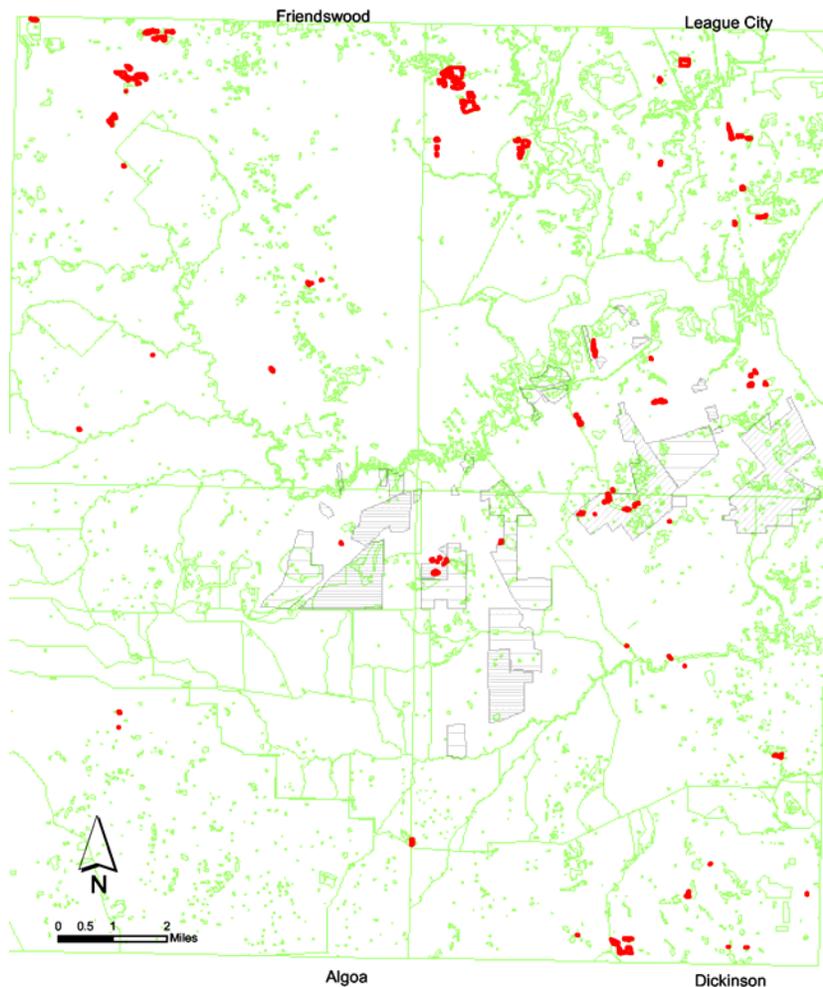
Table 4.9.1. Palustrine Wetlands developed in the circum-Galveston Bay quadrangles, 1992-1999.

USGS Quadrangle	Acres of Natural Palustrine Wetlands in 1992	Acres Developed by 1999	% Developed by 1999
Algoa	997.49	1.55	0.15
Anahuac	9896.78		0.00
Bacliff	53.96	2.95	5.47
Caplen	523.24	0.77	0.15
Christmas Point	999.13	1.85	0.19
Cove	8383.81		0.00
Dickinson	1128.26	43.49	3.85
Flake	1588.69		0.00
Friendswood	993.11	53.34	5.37
Frozen Point	14636.36		0.00
Galveston	838.63	12.99	1.55
High Island	5583.65		0.00
Highlands	2640.09	4.05	0.15
Hitchcock	3246.99	2.08	0.06
Hoskins Mound	5481.17		0.00
Jacinto City	3309.46	33.55	1.01
Lake Como	580.01	4.79	0.83
Lake Stephenson	11953.49		0.00
LaPorte	1414.45	20.13	1.42
League City	2755.36	152.18	5.52
Monroe City	9060.25		0.00
Mont Belvieu	3227.05	40.32	1.25
Morgan Point	1516.11	59.74	3.94
Mustang Bayou	3492.47		0.00
Oak Island	6075.92		0.00
Oyster Bayou	19117.05		0.00
Pasadena	873.97	43.99	5.03
Port Bolivar	46.51		0.00
San Luis Pass	81.75	3.75	4.59
Sea Isle	3233.28	2.59	0.08
Smith Point	93.51	1.32	1.41
Stanolind Reservoir	27230.89		0.00
Stowell	17549.77		0.00
The Jetties	38.45		0.00
Texas City	962.99	25.57	2.66
Umbrella Point	167.99		0.00
Virginia Point	2437.64	0.79	0.03
Total	172209.73	511.79	0.30

Given the amount of new development we know to be occurring in the Houston area, the 0.3% figure seems to be extremely low. But several qualifications need to be made about this data.

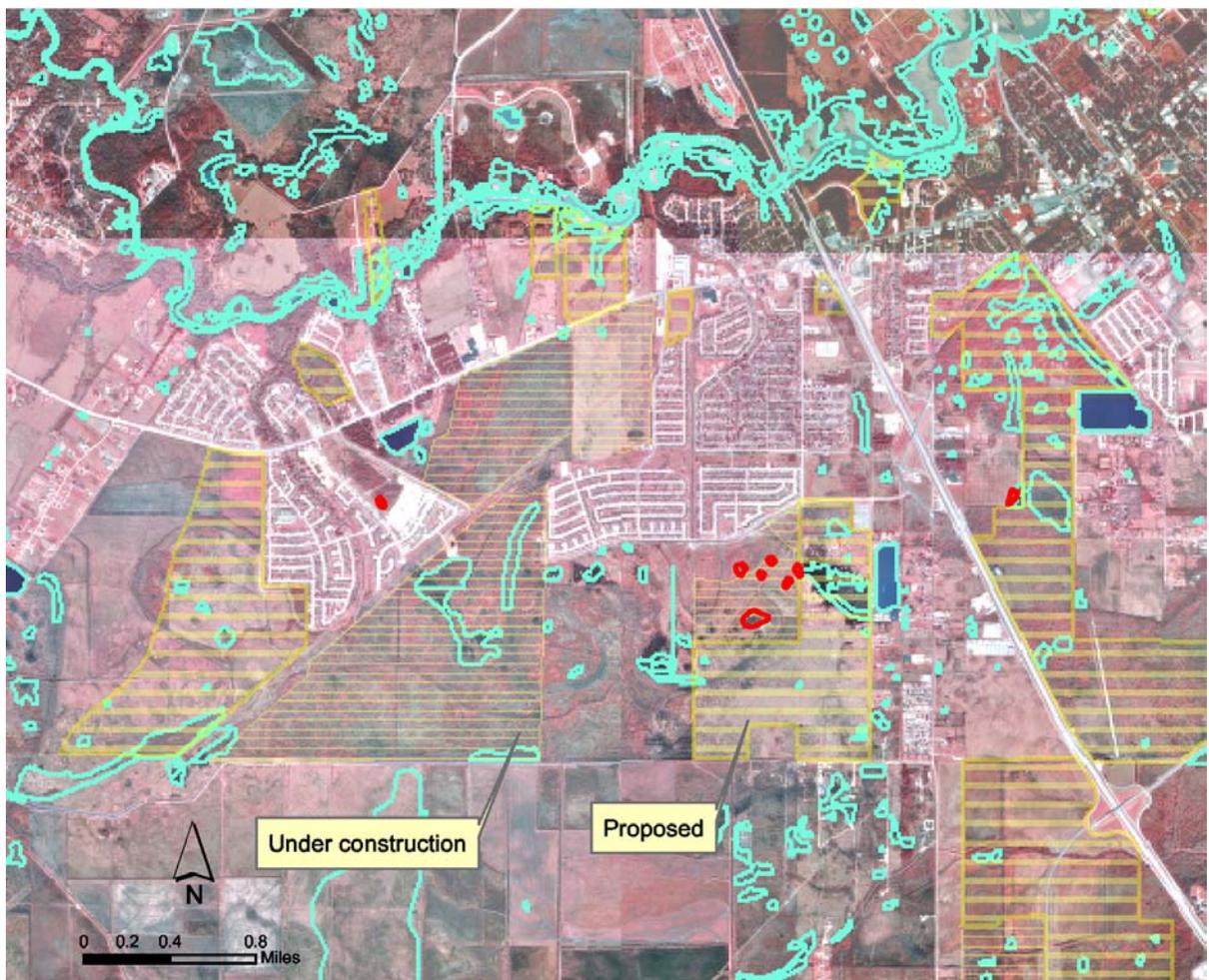
First, there are limitations in terms of dates of the available photography. Only 1995 photography was available for most of Chambers County. All of Harris County was limited to January of 1999 photography. The latest photography available for most of Galveston County was January 2000. We examined in greater detail the area around western League City, one of the fastest growing areas in the near-Bay environment. Figure 4.9.2 shows the NWI wetlands on these quadrangles, and areas of current and proposed growth in a selected area of League City. Clearly much of the development in this area has been after January of 1999. It would appear that most of the growth in the Houston area in the study period occurred to the west of this study area. (Parenthetically, this fact might suggest that a narrow focus on the circum-Bay area may miss significant watershed damage which could impact Galveston Bay water quality as much or more than those areas immediately surrounding the Bay).

Figure 4.9.2. Four of the quadrangles in the study area with highest development from 1992-1999. Green lines area wetlands and water bodies (1992 NWI). Red polygons are NWI wetlands destroyed by development by January of 1999. Gray lines are overlay of growth areas in a selected area of League City. These areas are either under development (close lines) or in preparation for development (widely-spaced lines).



Secondly, there is the issue of the reliability of the NWI maps. When the NWI maps show the presence of wetlands, it is highly probably that the areas mapped are in fact wetlands, although some errors do occur. On the other hand, the error is much greater in terms of areas not shown as wetlands. Figure 4.9.3 shows a detail of an area in western League City, an area of particularly intense development pressure. In the area labeled as “proposed development”, several dark circular and oblong areas are evident that are not mapped as NWI wetlands but that obviously are wetlands based on the geologic air photo signature of the prairie pothole - pimple mound complex, i.e., not all of the wetlands are captured in the NWI mapping. Nonetheless, the NWI maps can be taken as a “sampling” of the total, and if that sampling was at least somewhat random, then our analysis of developed wetlands can also be taken as a reasonable sample. Thus, the 0.3% figure may not be all that inaccurate for the study area, but extreme caution should be used when discussing the acreage figures.

Figure 4.9.3. Detail of Figure 4.9.2 area overlain on 1995 digital color IR aerial photograph. NWI wetlands and water bodies are in blue. NWI wetlands that were developed by 1999 are in red. Note the many additional NWI wetlands undergoing development. Major intersection is I-45 and Fm 518.



In terms of the timing, Figure 4.9.4 shows an area along Bay Area Boulevard in western League City. Much of the southeast quadrant has now been developed. Preparation for development had already begun when the 1999 Lambert photo was taken, but the development signature was not pronounced enough to register development status with the analyst (this kind of interpretation error would add very little to the final numbers). In addition to the small wetland in the cleared area, the tract with the much larger wetland just to the south has already been developed or is in the process of development, as is much of the corridor along the newly opened Bay Area Blvd between FM 528 and FM 518.

Figure 4.9.4. January 1999 Lambert color aerial photograph with NWI overlay. Major intersection in NW quadrant is Bay Area and FM 528 in Harris County.

