

Supplemental Map Information

Project ID: R02Y07P02

Project Title or Area: Corpus Christi Update

Source Imagery: 2006 Sub-meter True Color (USGS), only partial coverage of the work area. 2004 NAIP CIR County mosaics were used to outside of 2006 imagery.

Collateral Data: USGS NHD, USGS DRG, NWI digital data (previously mapped, 1990's era), Submerged Lands of Texas, Corpus Christi Area, University of Texas (see references for further information).

Inventory Method: Update mapping was performed in a heads-up environment, using ArcGIS (9.2). Digital delineations were done on-screen at a relative scale of 1:10,000 using the digital 2006 Sub-meter True Color and NAIP county mosaics. USGS NHD data was used to accurately define shorelines and large water bodies. Older-era NWI data were used where it accurately delineated wetlands. Feature Analyst (Automated feature extraction software) was also used in the southern part of the work area to delineate complex shoreline and wetland areas.

Classification:

Wetland Definition and Classification

The Service uses the Cowardin *et al.* (1979) definition of a wetland. This definition is the Service's official standard for classifying and mapping wetlands. It has also been adapted as the national standard for wetland mapping, monitoring and data reporting as determined by the Federal Geographic Data Committee. It is a two-part definition as indicated below:

Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water.

For purposes of this classification wetlands must have one or more of the following three attributes: 1) at least periodically, the land supports predominantly hydrophytes; 2) the substrate is predominantly undrained hydric soil; and 3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year

Data Limitations: National Wetlands Inventory digital data were derived from stereoscopic analysis of high altitude aerial photographs. Wetlands and riparian areas were identified based on vegetation, visible hydrology and geography in accordance with **Classification of Wetlands and Deepwater Habitats of the United States** (FWS/OBS – 79/31 December 1979) & **A System for Mapping Riparian Areas in the Western United States** (FWS 1998). There is a margin of error inherent in the use of aerial photos. Age, scale and emulsion of the aerial photos, as well as seasonal and climatic variations at the time of aerial photo acquisition may affect the way in which wetlands and riparian areas are identified.

General description of the Project Area: The project area falls along the Coastal Bend on the central Texas Gulf coast, within the Western Gulf Coastal Plain-Bay and Estuary Systems (Omernik), in the Dry Subhumid Climate Zone (Thornwaite, 1948).

- **Geography:** The project area includes a relatively large bay-estuary-lagoon system comprised of the Nueces, Corpus Christi, Redfish, Aransas, and Copano Bays and Laguna Madre-separated from the Gulf of Mexico and the inner shelf by a modern barrier-island complex, composed of San Jose, Mustang, and North Padre Islands. Astronomical tidal range (mean diurnal) is 1.5 ft. (Hayes, 1965). Mean annual precipitation is 30-32 inches/yr. (Carr, 1967). Severe tropical storms occur roughly every 10 years. This area is also subject to occasional drought.
- **Land use/Land Cover, Soils:** This, nearly level, part of the coastal plain is highly developed-including; urban development, agriculture and industry/petroleum refinement. The growing season averages 335 days a year. Crop production includes cotton, sorghum, and vegetables. Inland soils are generally heavy alluvial blackland soils, where closer to the coast, deep loose sandy Gulf-deposited soil complexes reside on top of tidal flats.

Description of wetland habitats: Almost all major wetland/Cowardin types are represented in this project area. Inland systems are dominated by large tidally and non-tidally flooded alluvial systems. Areas closer to the coast have depressional and dune/swale isolated wetland features. And the barrier islands and lands adjacent the bays have a variety of tidally inundated wetland complexes. The shallow bay areas, especially Laguna Madre are filled with subaqueous marine grasses.

NWI WETLAND CLASSIFICATION CODES, COWARDIN DESCRIPTION AND COMMON TERMINOLOGY

NWI Code	Cowardin Description	Common Description	Common Vegetation
<u>Marine Features</u>			
M1UB (L)	Marine subtidal, unconsolidated bottom	Open ocean/gulf	none
M2US (M, N, P)	Marine intertidal, unconsolidated shore	Beaches, sandbar	none
<u>Estuarine Features</u>			
E1UB (L)	Estuarine subtidal, unconsolidated bottom	Estuaries, bays, waterways	none
E1AB3 (L)	Estuarine subtidal, aquatic bed	Seagrasses	<i>Halodule beaudettei</i> (shoalgrass) <i>Ruppia maritima</i> (widgeongrass) <i>Thalassia testudinum</i> (turtlegrass) <i>Cymodocea filiformis</i> (matatee grass)

E2US (M, N, P)	Estuarine intertidal, unconsolidated shore	Sandbars, flats	none
E2AB3 (L)	Estuarine intertidal, aquatic bed	Seagrasses	<i>Halodule beaudettei</i> (shoalgrass) <i>Ruppia maritime</i> (widgeongrass) <i>Thalassia testudinum</i> (turtlegrass) <i>Cymodocea filiformis</i> (matatee grass)
E2SS3 (N, P)	Estuarine intertidal, Scrub-shrub, broad-leaved evergreen	Tidal marsh, mangroves	<i>Avicinnia germinans</i> (black mangrove)
E2EM1 (N, P)	Estuarine intertidal, emergent, persistent	Tidal marsh, emergent	<i>Spartina alteriflora</i> (smooth cordgrass) <i>Spartina spartinae</i> (gulf cordgrass) <i>Spartina patens</i> (marshhay cordgrass) <i>Batis maritima</i> (saltwort) <i>Salicornia sp.</i> (glasswort) <i>Distichlis spicata</i> (saltgrass) <i>Borrchia frutescens</i> (sea ox-eye) <i>Monanthachloe littoralis</i> (shoregrass) <i>Suaeda sp.</i> (seablite) <i>Iva sp.</i> (sumpweed)

Lacustrine Features

L1UB (H, K, V)	Lacustrine, limnetic, unconsolidated bottom	Lakes, reservoirs deeper than 6 meters	none
L2UB (F)	Lacustrine, littoral, unconsolidated bottom	Lakes, reservoirs less than 6 m. deep	none
L2US (C, A, J)	Lacustrine, littoral, unconsolidated shore	Shallow lakes, reservoirs, shore, flats	none

Riverine Features

R1UB (V)	Riverine, tidal, unconsolidated bottom	Tidally influenced river, low gradient	none
R1US (S, R)	Riverine, tidal, unconsolidated shore	Tidally influenced sandbar	none
R2UB (H)	Riverine, lower perennial, unconsolidated bottom	River	none

R2US (C, A)	Riverine, lower perennial, unconsolidated shore	Sand bar	none
<u>Palustrine Features</u>			
PUB (H, F, K)	Palustrine, unconsolidated bottom	Ponds, basins, natural/manmade	none
PAB3 (H, F, K)	Palustrine, rooted aquatic bed	Ponds, basins, natural/manmade	<i>Sagittaria spp.</i> (arrowhead) <i>Nuphar spp.</i> (spatterdock)
PAB4 (H, F, K)	Palustrine, floating aquatic bed	Ponds, basins, natural/manmade	<i>Lemna spp.</i> <i>Eichornia crassipes</i> (water hyacinth)
PUS (C, A)	Palustrine, unconsolidated shore	Flats, shallow basins, shore, natural, man made	none
PEM1 (F, C, A, J, K) (T, S, R - Tidally influenced)	Palustrine, emergent	Marsh, prairie, basin, depression, natural/manmade	<i>Typha latifolia</i> (cattail) <i>Cyperus spp.</i> (flatsedge) <i>Spartina spartinae</i> (gulf cordgrass) <i>Spartina patens</i> (marshhay cordgrass) <i>Scirpus spp.</i> (bulrush) <i>Juncus spp.</i> (rush) <i>Eleocharis spp.</i> (spikerush) <i>Sporobolus spp.</i> (dropseed) <i>Polygonum spp.</i> (knotweed) <i>Distichlis spicata</i> (saltgrass) <i>Iva spp.</i> (sumpweed) <i>Borrchia frutescens</i> (sea ox-eye) <i>Paspalum lividum</i> (longtom) <i>Aster spinosus</i> (spiny aster) <i>Panicum spp.</i> <i>Andropogon virginicus</i> (broomsedge bluestem) <i>Helianthus Spp.</i> (sunflower) <i>Sorghum halepense</i> (Johnsongrass) <i>Croton spp.</i> (doveweed)

PSS1 (F, C, A, J) (R, S – tidally influenced)	Palustrine, scrub-shrub, broad-leaved deciduous	Shrub swamp, flood- plain, bottomland	<i>Salix nigra</i> (black willow) <i>Cephalanthus occidentalis</i> (buttonbush) <i>Parkinsonia aculeate</i> (retama) <i>Acacia farnesiana</i> (huisache) <i>Celtis spp.</i> (hackberry) <i>Ilex vomitoria</i> (yaupon) <i>Sesbania spp.</i> (rattlebush)
PSS2 (C, A, J)	Palustrine, scrub-shrub, needle-leaved deciduous	Shrub swamp, flood- plain, bottomland	<i>Tamarix sp.</i> (salt cedar)
PFO1 (F, C, A)	Palustrine, forest, broad- leaved deciduous	Forested swamp, floodplain, bottomland	<i>Salix nigra</i> (black willow) <i>Fraxinus spp.</i> (ash) <i>Ulmus crassifolia</i> (cedar elm) <i>Celtis spp.</i> (hackberry) <i>Populus deltoides</i> (cottonwood) <i>Carya illinoensis</i> (pecan) <i>Quercus spp.</i> (oak)

List of wetland plant species with indicator status: Detailed information on plant species indicator status can be found at; <http://plants.usda.gov/wetinfo.html>

Regional specialized conventions/Other discussion of mapping issues:

The 2006 sub-meter USGS True Color imagery was of high quality with excellent spatial resolution. The imagery did appear “drier” than the 2004 NAIP CIR imagery, with “drier” wetland features (A & J Water Regimes) not showing a strong wetland signature response. Also, seagrass features identified on University of Texas maps, and visible in the 2004 CIR NAIP imagery, also, did not show a strong wetland signature response. The 2004 CIR imagery was used to define seagrass habitats.

Broad-leaved evergreen shrub (PSS3) species such as *Baccharis spp.* were included with broad-leaved deciduous (PSS1) due to limited occurrence and distribution.

Areas mapped as mangroves E2SS3 (N, P) may contain substantial emergent habitat as well. The distinction between the two was difficult on both eras of photography.

All submerged (subtidal) rooted AB will be identified as E1AB3L. Aquatic bed in shallower margins may be identified as E2AB3M.

Many of the shallow open water bodies within the estuarine marsh were identified as E2USM. Most of these were labeled E1UBL on the old NWI data. It is assumed, for this update, that these areas are shallow and not necessarily subtidal.

Freshwater tidal water regimes will only be applied where large riverine systems and the upper estuary systems interface. Non-tidally flooded wetlands on the high side of tidal wetlands will use standard non-tidal water regimes.

Some higher tidal flats, on the 04 CIR were exhibiting a signature that could have been alge. These areas of alge are very temporary. The other collateral data sources identified these areas as US. Algal areas will not be identified in this study area, unless corroborated by the old NWI data and the UT BEG maps.

Live Oak ridge has many “pimple-mound” (wetland/upland complex) areas. These areas were previously mapped PEM1A/U. For the update, the U can't be used, so wetland areas were differentiated with more detail than before. For reference, these small emergent wetlands had more definition on the 04 CIR.

It was difficult, in areas, to distinguish between rooted AB and US in some of the deeper water flats. Some areas exhibiting AB-type signatures were identified on the previous NWI data and the UT BEG maps as US. Until field surveys can be conducted, the collateral data will be used to make the decision.

References:

Carr, J. T., 1967, The climate and physiography of Texas: Texas Water Development Board Report 53, 27 p.

Cowardin, L.M., V. Carter, F.C., Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service, Washington, DC. FWS/OBS-79/31

Hayes, M. O., 1965, Sedimentation on the semiarid, wave-dominated coast (south Texas), with emphasis on hurricane effects: University of Texas, Austin, Ph.D. dissertation, 350 p.

Thornwaite, C. W., 1948, An approach toward a rational classification of climate: Geographical Review, v. 38, no. 1, p. 55-94.

White, W. A., Calnan, T. R., Morton, R. A., Kimble, R. S., Littleton, T. G., McGowen, J. H., Nance, H. S., and Schmedes, K. E., Preface by Fisher, W. L. 1983, Submerged Lands Of Texas, Chorus Christi Area: Sediments, Geochemistry, Benthic Macroinvertebrates, And Associated Wetlands. Bureau of Economic Geology, University of Texas, Austin, 154 p.

Wetlands Quality Review Certification

Work Area/Project Title: R02Y07P02 Corpus Christi Update

Location (state and city, counties, watershed, or area): Coastal Texas, Corpus Christi area.

Size of Work Area: 1.2 Million acres 32 quads

Quality Control during Interpretation (QCI) Performed by:

Names and Affiliations: Ryan McHale USFWS Photo Interpreter, Jim Dick, Reg. Wetlands Coordinator

Percent of Area reviewed: 100%

Dates of Review: 4/08-10/08

Regional QC of Final Submission (QCF) Performed by:

Name: Jim Dick

Affiliation: USFWS, Regional Wetlands Coordinator

Percent of Area reviewed: 100%

Dates of Review: 12/08

Date(s) of Spot Check by Regional Wetlands Coordinator: N/A

National QA Review (QA) Performed by:

Name:

Affiliation:

Percent of Area reviewed:

Dates of Review:

The Region certifies that the wetlands geospatial data submission listed above has gone through all Regional quality review steps and meets NWI data requirements for completeness and quality.

Regional Wetland Coordinator:

Jim Dick, Region 2 (Certified)

Region :2 Regional Certification Control Number: _____ Date: 1/5/09

National Wetlands Inventory Program Region 2

500 Gold Ave. SW Room 4012

Albuquerque, NM 87102