

AN ECOLOGICAL CHARACTERIZATION STUDY OF THE CHENIER PLAIN COASTAL ECOSYSTEM OF LOUISIANA AND TEXAS was prepared for the National Coastal Ecosystems Team, Office of Biological Services, U.S. Fish and Wildlife Service. James G. Gosselink, Louisiana State University, was principal investigator. Funding was provided by the Office of Research and Development, U.S. Environmental Protection Agency.

Copies of Volume I (Narrative Report) FWS/OBS-78/9, Volume II (Data Source Appendix) FWS/OBS-78/10, and Volume III (Atlas) FWS/OBS-78/11, may be obtained from:

National Coastal Ecosystems Team
U.S. Fish and Wildlife Service
NASA-Slidell Computer Complex
1010 Gause Blvd.
Slidell, LA 70458

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- 6A and 6B – Special Features

The Biological Services Program was established within the U.S. Fish and Wildlife Service to supply scientific information and methodologies on key environmental issues that impact fish and wildlife resources and their supporting ecosystems. The mission of the program is as follows:

- To strengthen the Fish and Wildlife Service in its role as a primary source of information on national fish and wildlife resources, particularly in respect to environmental impact assessment.
- To gather, analyze, and present information that will aid decisionmakers in the identification and resolution of problems associated with major changes in land and water use.
- To provide better ecological information and evaluation for Department of the Interior development programs, such as those relating to energy development.

Information developed by the Biological Services Program is intended for use in the planning and decisionmaking process to prevent or minimize the impact of development on fish and wildlife. Research activities and technical assistance services are based on analysis of the issues, a determination of the decisionmakers involved and their information needs, and an evaluation of the state of the art to identify information gaps and determine priorities. This is a strategy that will ensure that the products produced are disseminated are timely and useful.

Projects have been initiated in the following areas: coal extraction and conversion; power plants, geothermal, mineral, and oil-shale development; water resource analysis, including stream alterations and western water allocation; coastal ecosystems and Outer Continental Shelf development; and systems inventory, including National Wetland Inventory, habitat classification and analysis, and information transfer.

The Biological Services Program consists of the Office of Biological Services in Washington, D.C., which is responsible for overall planning and management; National Teams, which provide the Program's central scientific and technical expertise and arrange for contracting biological services studies with states, universities, consulting firms, and others; Regional Staff, who provide a link to problems at the operating level; and staff at certain Fish and Wildlife Service research facilities, who conduct in-house research studies.

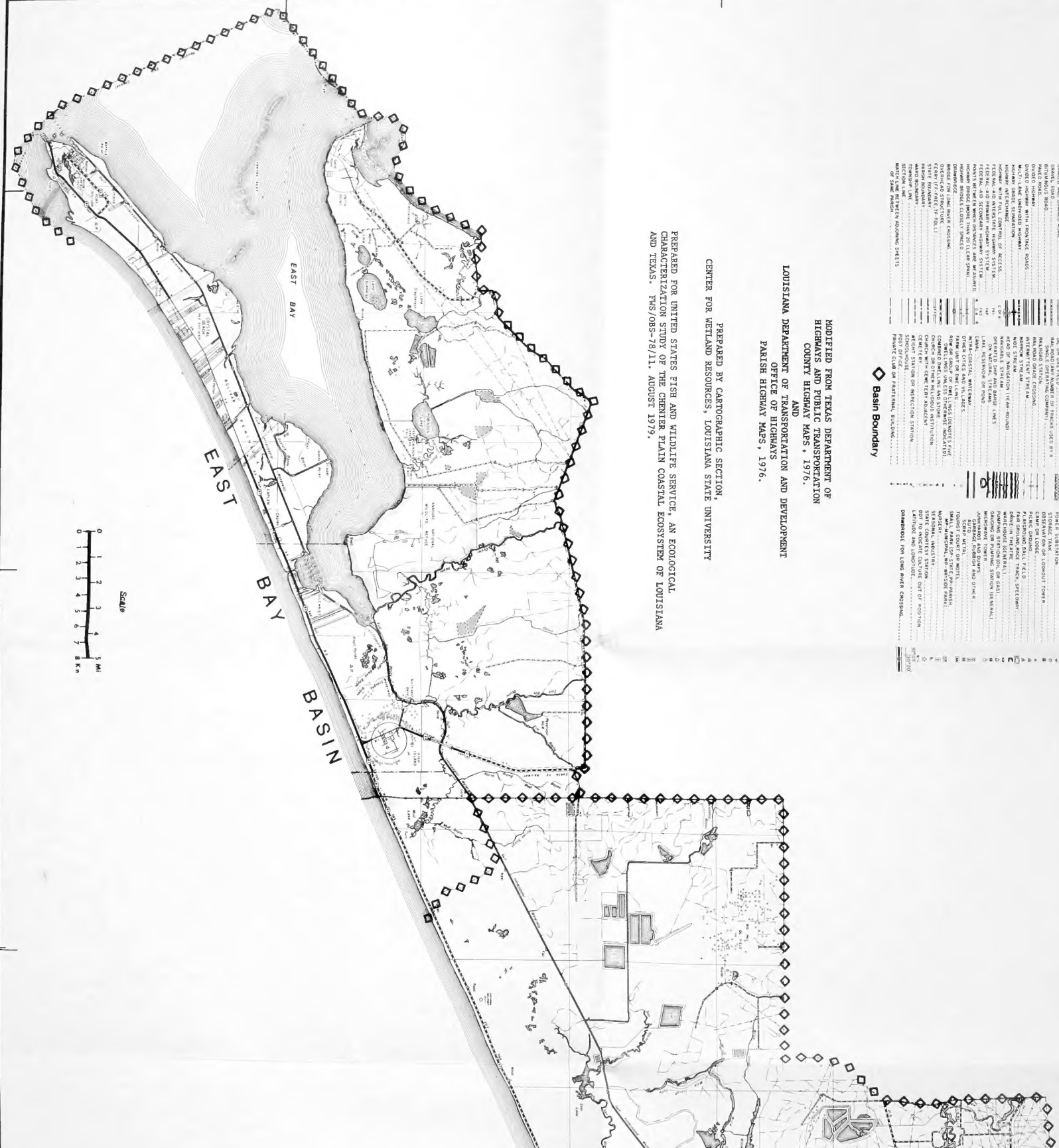
U.S. FISH AND WILDLIFE SERVICE
DOCUMENT COLLECTION

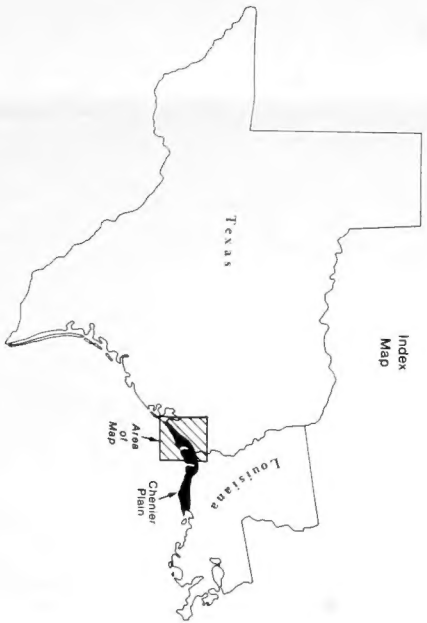
PLATE 1A INDEX MAP



LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
 MODIFIED FROM TEXAS DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION COUNTY HIGHWAY MAPS, 1976,
 AND
 LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT OFFICE OF HIGHWAYS PARISH HIGHWAY MAPS, 1976.

PREPARED BY CARTOGRAPHIC SECTION,
 CENTER FOR WETLAND RESOURCES, LOUISIANA STATE UNIVERSITY
 PREPARED FOR UNITED STATES FISH AND WILDLIFE SERVICE, AN ECOLOGICAL CHARACTERIZATION STUDY OF THE CHENIERE FLAIN COASTAL ECOSYSTEM OF LOUISIANA AND TEXAS. FWS/OBS-78/11, AUGUST 1979.





Index Map

29°15'

SABINE RIVER BASIN



94°00'

93°45'

30°00'

29°45'

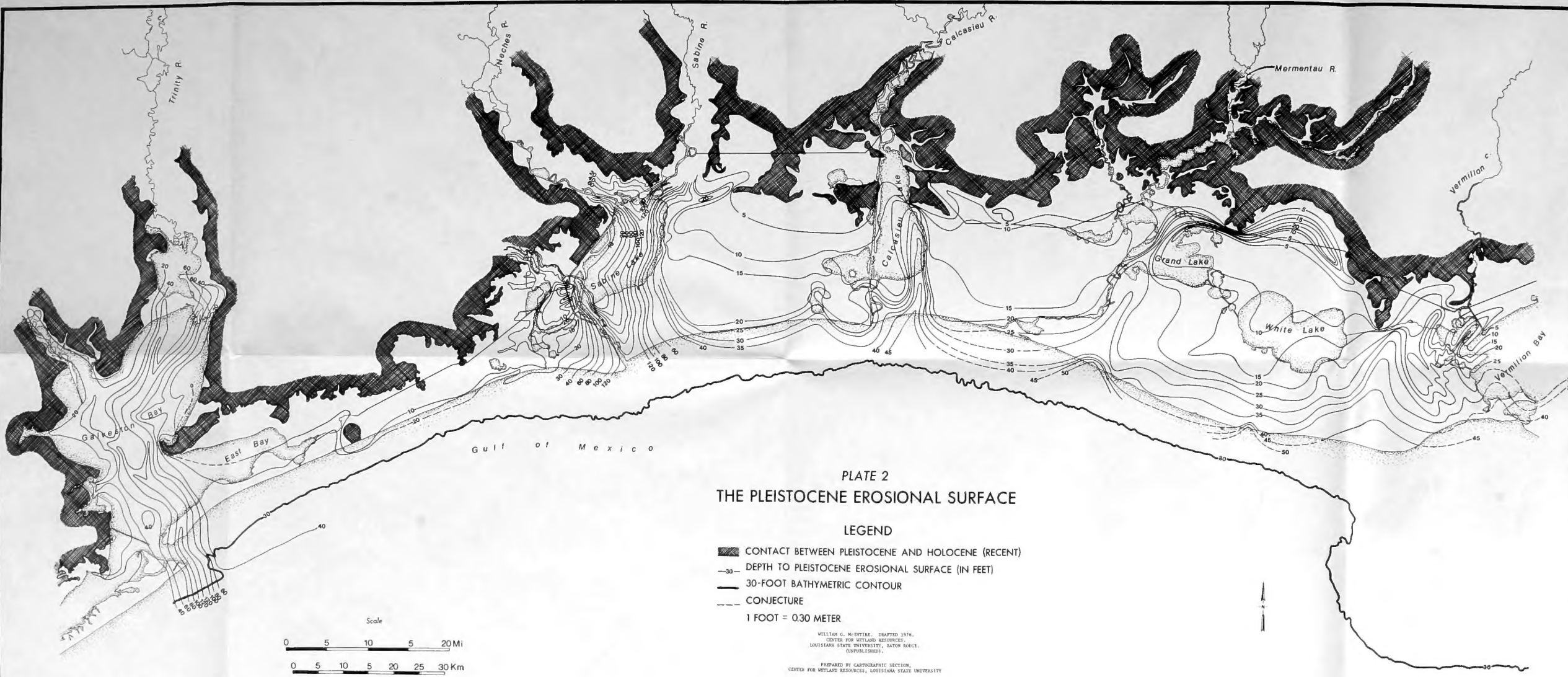




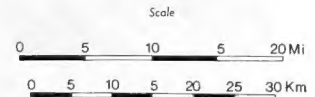


PLATE 2
 THE PLEISTOCENE EROSIONAL SURFACE

LEGEND

-  CONTACT BETWEEN PLEISTOCENE AND HOLOCENE (RECENT)
-  DEPTH TO PLEISTOCENE EROSIONAL SURFACE (IN FEET)
-  30-FOOT BATHYMETRIC CONTOUR
-  CONJECTURE
- 1 FOOT = 0.30 METER









WILLIAM G. MCINTIRE, DRAFTED 1976.
 CENTER FOR WETLAND RESOURCES,
 LOUISIANA STATE UNIVERSITY, BATON ROUGE,
 (UNPUBLISHED).

PREPARED BY CARTOGRAPHIC SECTION,
 CENTER FOR WETLAND RESOURCES, LOUISIANA STATE UNIVERSITY

PREPARED FOR UNITED STATES FISH AND WILDLIFE SERVICE, AN ECOLOGICAL
 CHARACTERIZATION STUDY OF THE CHENIERE PLAIN COASTAL ECOSYSTEM OF LOUISIANA
 AND TEXAS, FW/OCS-76/11, AUGUST 1979.

PLATE 3A
CHENIER PLAIN HABITAT GROUPS

LEGEND

-  AQUATIC -permanently flooded, non-vegetated inland open water and nearshore Gulf habitats.
-  WETLANDS -periodically flooded lands characterized by emergent vegetation. See Plate 4
-  AGRICULTURE -cultivated cropland and improved pasture.
-  RIDGES AND UPLAND FOREST -naturally vegetated cheniers, levees, spoil banks, Pleistocene islands, and prairie surface.
-  URBAN -land areas developed for residential and industrial use.
-  BASIN BOUNDARY

PREPARED FROM UNITED STATES GEOLOGICAL SURVEY 1974-75, 1:124,000
ORTHOPHOTO QUADRANGLES, ADVANCED EDITION,
NASA HIGH ALTITUDE FALSE COLOR INFRARED PHOTOGRAPH
MISSION 289 WELD 7, 1974.

PREPARED BY CARTOGRAPHIC SECTION,
CENTER FOR WETLAND RESOURCES, LOUISIANA STATE UNIVERSITY

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CHARACTERIZATION STUDY OF THE CHENIER PLAIN COASTAL ECOSYSTEM OF
LOUISIANA AND TEXAS. FWS/OBS-78/11. AUGUST 1979.

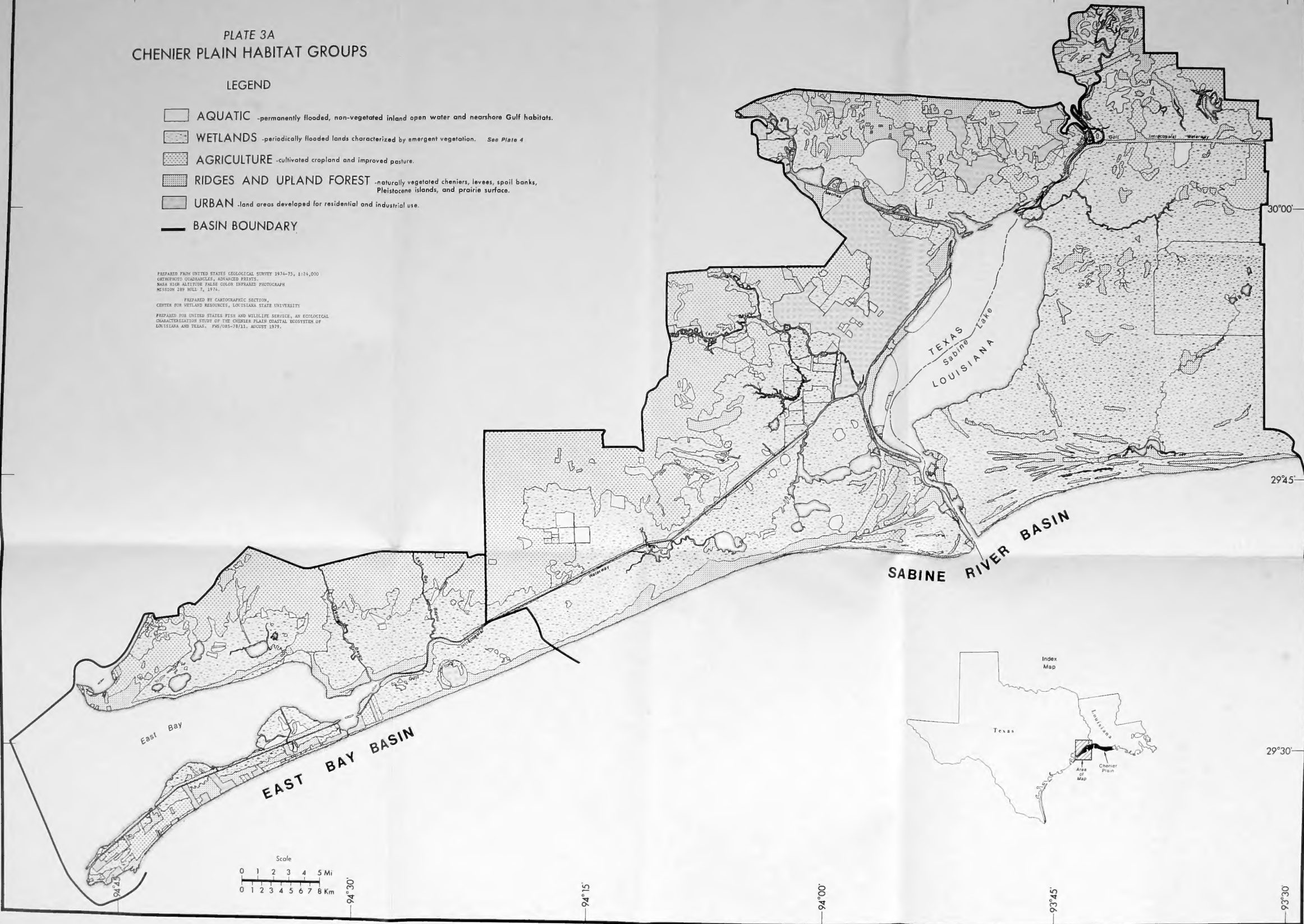










PLATE 4A
CHENIER PLAIN WETLAND HABITATS

LEGEND

-  NON-WETLAND HABITATS
-  SALT MARSH - saline intertidal marshes and associated small ponds, dominated by smooth cordgrass (*Spartina alterniflora*), with tallgrass (*Distichlis spicata*) and blackrush (*Uncus pumilus*) common.
-  BRACKISH MARSH - intertidal marshes and associated small ponds dominated by saltmeadow cordgrass (*Spartina patens*) and saltgrass; salinities generally less than 10 ‰
-  INTERMEDIATE MARSH - marshes and associated small ponds, periodically flooded with nearly fresh water, but occasionally by brackish water. Dominated by saltmeadow cordgrass, bulltongue (*Sagittaria falcata*), and seashore paspalum (*Paspalum vaginatum*).
-  FRESH MARSH - marshes flooded by fresh water, and with a diverse flora dominated by maidencane (*Panicum hemitomon*), bulltongue, and alligatorweed (*Alternanthera philoxeroides*).
-  IMPOUNDED MARSH - marshes surrounded by dikes, spoil banks, or natural levees that modify normal flooding. These exist in saline to fresh areas. They may be permanently flooded or pumped dry, but all are dominated by native emergent wetland vegetation (as opposed to impounded agricultural land).
-  SWAMP FOREST - forested freshwater wetlands with diverse flora dominated by baldcypress (*Taxodium distichum*) and tupelo (*Nyssa aquatica*).
-  BASIN BOUNDARY

PREPARED FROM UNITED STATES GEOLOGICAL SURVEY 1974-75, 1:24,000
ORTHOPHOTO QUADRANGLES, ADVANCED PRINTS.

CHAPPEL, R., 1972. VEGETATION, WATER AND SOIL
CHARACTERISTICS OF THE LOUISIANA COASTAL REGION.
LOUISIANA AGRICULTURAL EXPERIMENT STATION BULLETIN 664.
FINNEY, W. L., J., H. ROYDEN, L. F. BROWN, JR., AND
CHRYST, C. G., 1972. ENVIRONMENTAL GEOLOGIC ATLAS OF
THE TEXAS COASTAL ZONE, GALVESTON-HOUSTON AREA.
BUREAU OF ECONOMIC GEOLOGY, UNIVERSITY OF TEXAS AT
AUSTIN.

_____, 1973. ENVIRONMENTAL GEOLOGIC ATLAS OF THE
TEXAS COASTAL ZONE, BEAUMONT-ROCKPORT AREA.
BUREAU OF ECONOMIC GEOLOGY, UNIVERSITY OF TEXAS AT
AUSTIN.

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LOUISIANA AND TEXAS. FWS/OBS-78/13. AUGUST 1979.

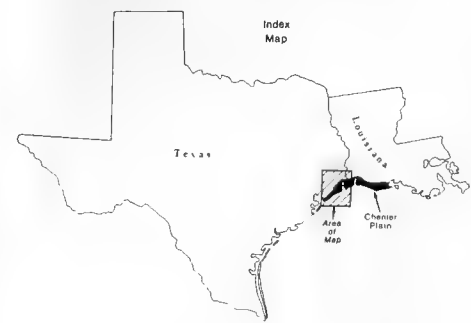
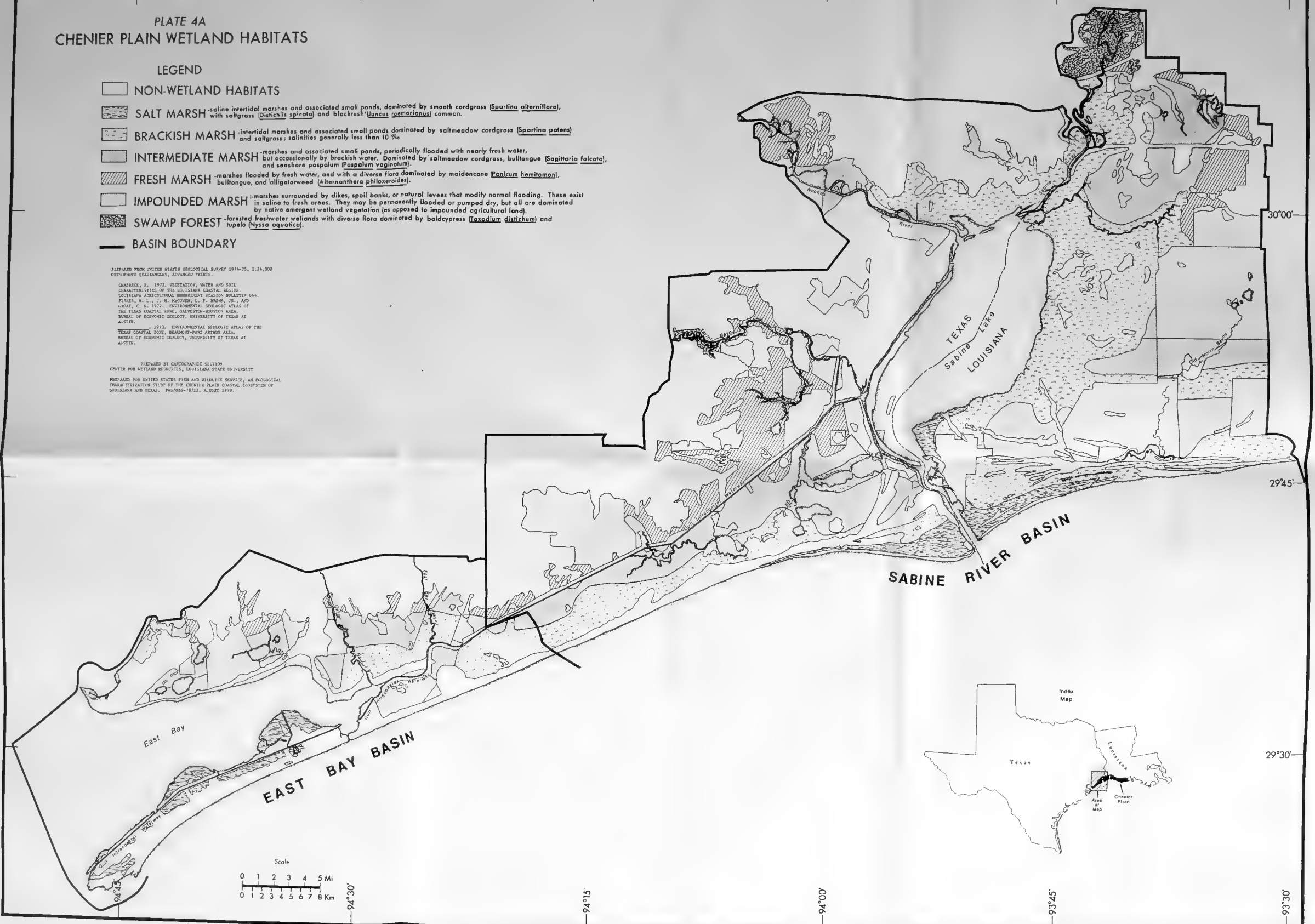


PLATE 5A
CANALS AND POINT SOURCE DISCHARGES
LEGEND

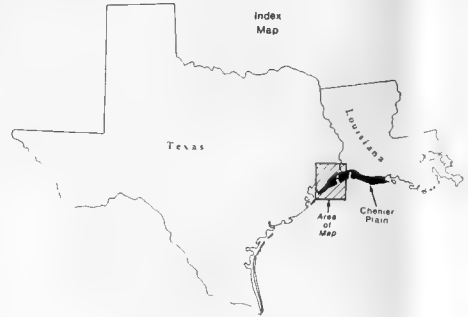
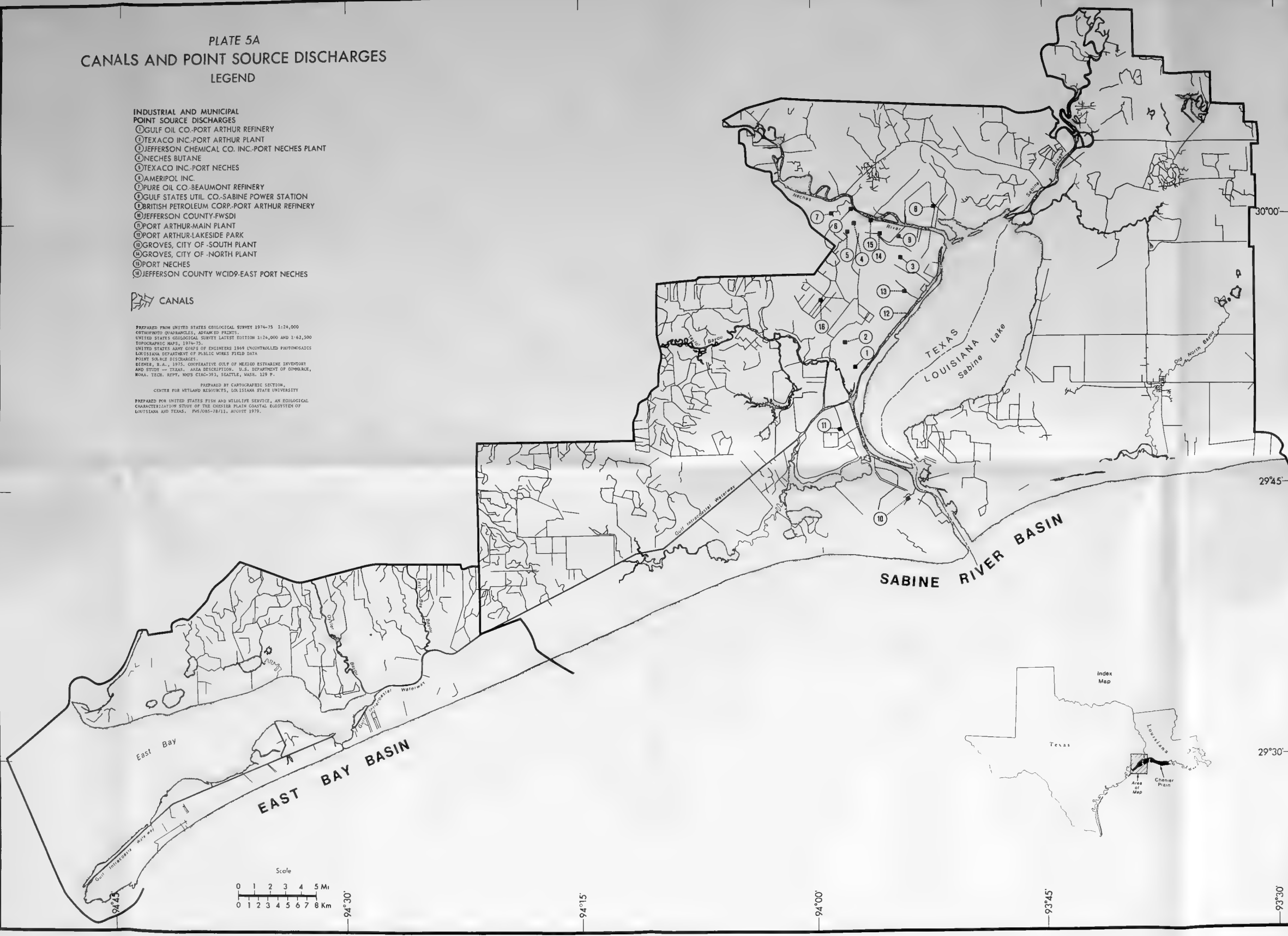
- INDUSTRIAL AND MUNICIPAL
POINT SOURCE DISCHARGES**
- ① GULF OIL CO.-PORT ARTHUR REFINERY
 - ② TEXACO INC.-PORT ARTHUR PLANT
 - ③ JEFFERSON CHEMICAL CO. INC.-PORT NECHES PLANT
 - ④ NECHES BUTANE
 - ⑤ TEXACO INC.-PORT NECHES
 - ⑥ AMERIPOL INC.
 - ⑦ PURE OIL CO.-BEAUMONT REFINERY
 - ⑧ GULF STATES UTIL. CO.-SABINE POWER STATION
 - ⑨ BRITISH PETROLEUM CORP.-PORT ARTHUR REFINERY
 - ⑩ JEFFERSON COUNTY-FWSDI
 - ⑪ PORT ARTHUR-MAIN PLANT
 - ⑫ PORT ARTHUR-LAKESIDE PARK
 - ⑬ GROVES, CITY OF -SOUTH PLANT
 - ⑭ GROVES, CITY OF -NORTH PLANT
 - ⑮ PORT NECHES
 - ⑯ JEFFERSON COUNTY WCID9-EAST PORT NECHES

 CANALS

PREPARED FROM UNITED STATES GEOLOGICAL SURVEY 1974-75 1:24,000
ORTHOPHOTO QUADRANGLES, ADVANCED PRINTS.
UNITED STATES GEOLOGICAL SURVEY LATEST EDITION 1:24,000 AND 1:62,500
TOPOGRAPHIC MAPS, 1974-75.
UNITED STATES ARMY CORPS OF ENGINEERS 1968 UNCONTROLLED PHOTOGRAMMETS
LOUISIANA DEPARTMENT OF PUBLIC WORKS FIELD DATA
POINT SOURCE DISCHARGES.
BENDER, S.A., 1975. COOPERATIVE USE OF HELICOPTER ESTUARINE INVENTORY
AND STUDY - TEXAS. AREA DESCRIPTION. U.S. DEPARTMENT OF COMMERCE,
NOAA. TECH. REPT. NOS. CIRC-393, SEATTLE, WASH. 129 P.

PREPARED BY CARTOGRAPHIC SECTION,
CENTER FOR WETLAND RESOURCES, LOUISIANA STATE UNIVERSITY

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CHARACTERIZATION STUDY OF THE CHENER PLAIN COASTAL ECOSYSTEM OF
LOUISIANA AND TEXAS. FWS/OBS-78/11. AUGUST 1978.



94°30'

94°30'

94°15'

94°00'

93°45'

93°30'




30°00'

29°45'

29°30'

PLATE 6A SPECIAL FEATURES

LEGEND

-  ARCHEOLOGICAL SITES
-  BIRD NESTING COLONIES
-  OYSTER REEFS

ARCHEOLOGICAL SITES PREPARED FROM DATA SUPPLIED BY MORGAN, R. H., CURTISS, MISSISSIPPI STATE UNIVERSITY GEOLOGICAL MUSEUM, ARCHEOLOGICAL SITES IN COASTAL LOUISIANA; STONE, C. V., TEXAS AGRICULTURAL RESEARCH LABORATORY, UNIVERSITY OF TEXAS AT AUSTIN.

BIRD NESTING COLONY DATA TAKEN FROM THE TEXAS COLONIAL WATER BIRD COLONY, 1917-1919; TEXAS PARKS AND WILDLIFE DEPARTMENT, 1918; FA REP. SER. 13, AND FORSMAN, J. W., 1917; NESTING COLONIES OF BANKSWAGERS AND MARRING BIRDS, COASTAL LOUISIANA, MISSISSIPPI AND ALABAMA, U.S. FISH AND WILDLIFE SERVICE, FO-088 - 77/07.

OYSTER REEF LOCATIONS FROM LOUISIANA WILDLIFE AND FISHERIES, TEXAS PARKS AND WILDLIFE, AND DICKEY, B. A., 1931; COOPERATIVE COLLECTOR OF HELIX ESTUARINE INVENTORY AND STUDY - TEXAS - AREA DESCRIPTION, U.S. DEPARTMENT OF COMMERCE, WILIA TECH. REP. DORS CIRC-393, SEATTLE, WASH., 129 P.

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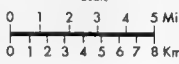
ARCHEOLOGICAL SITES

SITE	DESCRIPTION	78	DESCRIPTION	80	DESCRIPTION
1	Site on point above bay	32	Group of simple mounds near river channel, mounds set in	80	Destroyed shell midden on ridge on
2	Site on point above bay	33	Simple mound, mounds set in	81	Destroyed shell midden on ridge on
3	Large area of scattered shell	34	Destroyed shell midden on north	82	Destroyed shell midden on ridge on
4	Small mound, some pottery, shell	35	Simple mound, mounds set in	83	Destroyed shell midden on ridge on
5	Small shell midden	36	Simple mound, mounds set in	84	Destroyed shell midden on ridge on
6	Small shell midden	37	Simple mound, mounds set in	85	Destroyed shell midden on ridge on
7	Small shell midden	38	Simple mound, mounds set in	86	Destroyed shell midden on ridge on
8	Small shell midden	39	Simple mound, mounds set in	87	Destroyed shell midden on ridge on
9	Small shell midden	40	Simple mound, mounds set in	88	Destroyed shell midden on ridge on
10	Small shell midden	41	Simple mound, mounds set in	89	Destroyed shell midden on ridge on
11	Small shell midden	42	Simple mound, mounds set in	90	Destroyed shell midden on ridge on
12	Small shell midden	43	Simple mound, mounds set in	91	Destroyed shell midden on ridge on
13	Small shell midden	44	Simple mound, mounds set in	92	Destroyed shell midden on ridge on
14	Small shell midden	45	Simple mound, mounds set in	93	Destroyed shell midden on ridge on
15	Small shell midden	46	Simple mound, mounds set in	94	Destroyed shell midden on ridge on
16	Small shell midden	47	Simple mound, mounds set in	95	Destroyed shell midden on ridge on
17	Small shell midden	48	Simple mound, mounds set in	96	Destroyed shell midden on ridge on
18	Small shell midden	49	Simple mound, mounds set in	97	Destroyed shell midden on ridge on
19	Small shell midden	50	Simple mound, mounds set in	98	Destroyed shell midden on ridge on
20	Small shell midden	51	Simple mound, mounds set in	99	Destroyed shell midden on ridge on
21	Small shell midden	52	Simple mound, mounds set in	100	Destroyed shell midden on ridge on
22	Small shell midden	53	Simple mound, mounds set in	101	Destroyed shell midden on ridge on
23	Small shell midden	54	Simple mound, mounds set in	102	Destroyed shell midden on ridge on
24	Small shell midden	55	Simple mound, mounds set in	103	Destroyed shell midden on ridge on
25	Small shell midden	56	Simple mound, mounds set in	104	Destroyed shell midden on ridge on
26	Small shell midden	57	Simple mound, mounds set in	105	Destroyed shell midden on ridge on
27	Small shell midden	58	Simple mound, mounds set in	106	Destroyed shell midden on ridge on
28	Small shell midden	59	Simple mound, mounds set in	107	Destroyed shell midden on ridge on
29	Small shell midden	60	Simple mound, mounds set in	108	Destroyed shell midden on ridge on
30	Small shell midden	61	Simple mound, mounds set in	109	Destroyed shell midden on ridge on
31	Small shell midden	62	Simple mound, mounds set in	110	Destroyed shell midden on ridge on
32	Small shell midden	63	Simple mound, mounds set in	111	Destroyed shell midden on ridge on
33	Small shell midden	64	Simple mound, mounds set in	112	Destroyed shell midden on ridge on
34	Small shell midden	65	Simple mound, mounds set in	113	Destroyed shell midden on ridge on
35	Small shell midden	66	Simple mound, mounds set in	114	Destroyed shell midden on ridge on
36	Small shell midden	67	Simple mound, mounds set in	115	Destroyed shell midden on ridge on
37	Small shell midden	68	Simple mound, mounds set in	116	Destroyed shell midden on ridge on
38	Small shell midden	69	Simple mound, mounds set in	117	Destroyed shell midden on ridge on
39	Small shell midden	70	Simple mound, mounds set in	118	Destroyed shell midden on ridge on
40	Small shell midden	71	Simple mound, mounds set in	119	Destroyed shell midden on ridge on
41	Small shell midden	72	Simple mound, mounds set in	120	Destroyed shell midden on ridge on
42	Small shell midden	73	Simple mound, mounds set in	121	Destroyed shell midden on ridge on
43	Small shell midden	74	Simple mound, mounds set in	122	Destroyed shell midden on ridge on
44	Small shell midden	75	Simple mound, mounds set in	123	Destroyed shell midden on ridge on
45	Small shell midden	76	Simple mound, mounds set in	124	Destroyed shell midden on ridge on
46	Small shell midden	77	Simple mound, mounds set in	125	Destroyed shell midden on ridge on
47	Small shell midden	78	Simple mound, mounds set in	126	Destroyed shell midden on ridge on
48	Small shell midden	79	Simple mound, mounds set in	127	Destroyed shell midden on ridge on
49	Small shell midden	80	Simple mound, mounds set in	128	Destroyed shell midden on ridge on
50	Small shell midden	81	Simple mound, mounds set in	129	Destroyed shell midden on ridge on
51	Small shell midden	82	Simple mound, mounds set in	130	Destroyed shell midden on ridge on
52	Small shell midden	83	Simple mound, mounds set in	131	Destroyed shell midden on ridge on
53	Small shell midden	84	Simple mound, mounds set in	132	Destroyed shell midden on ridge on
54	Small shell midden	85	Simple mound, mounds set in	133	Destroyed shell midden on ridge on
55	Small shell midden	86	Simple mound, mounds set in	134	Destroyed shell midden on ridge on
56	Small shell midden	87	Simple mound, mounds set in	135	Destroyed shell midden on ridge on
57	Small shell midden	88	Simple mound, mounds set in	136	Destroyed shell midden on ridge on
58	Small shell midden	89	Simple mound, mounds set in	137	Destroyed shell midden on ridge on
59	Small shell midden	90	Simple mound, mounds set in	138	Destroyed shell midden on ridge on

POPULATIONS OF BIRD NESTING COLONIES

COLONY	SPECIES PRESENT	1978 POPULATION (EST)	COMMON AND SCIENTIFIC NAME
A	Baldpate	78	Black-necked grebe (<i>Actonyx</i>)
B	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
C	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
D	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
E	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
F	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
G	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
H	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
I	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
J	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
K	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
L	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
M	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
N	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
O	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
P	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
Q	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
R	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
S	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
T	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
U	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
V	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
W	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
X	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
Y	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)
Z	Black-necked grebe	100	Black-necked grebe (<i>Actonyx</i>)

*Data indicates that species were present during previous censuses but had during the 1978 census.



29°30'

29°45'

30°00'

0 1 2 3 4 5 Mi
0 1 2 3 4 5 6 7 8 Km

94°15'

94°00'

94°00'

93°45'

93°30'

93°30'

93°15'

93°00'

92°45'

92°30'

92°15'

92°00'

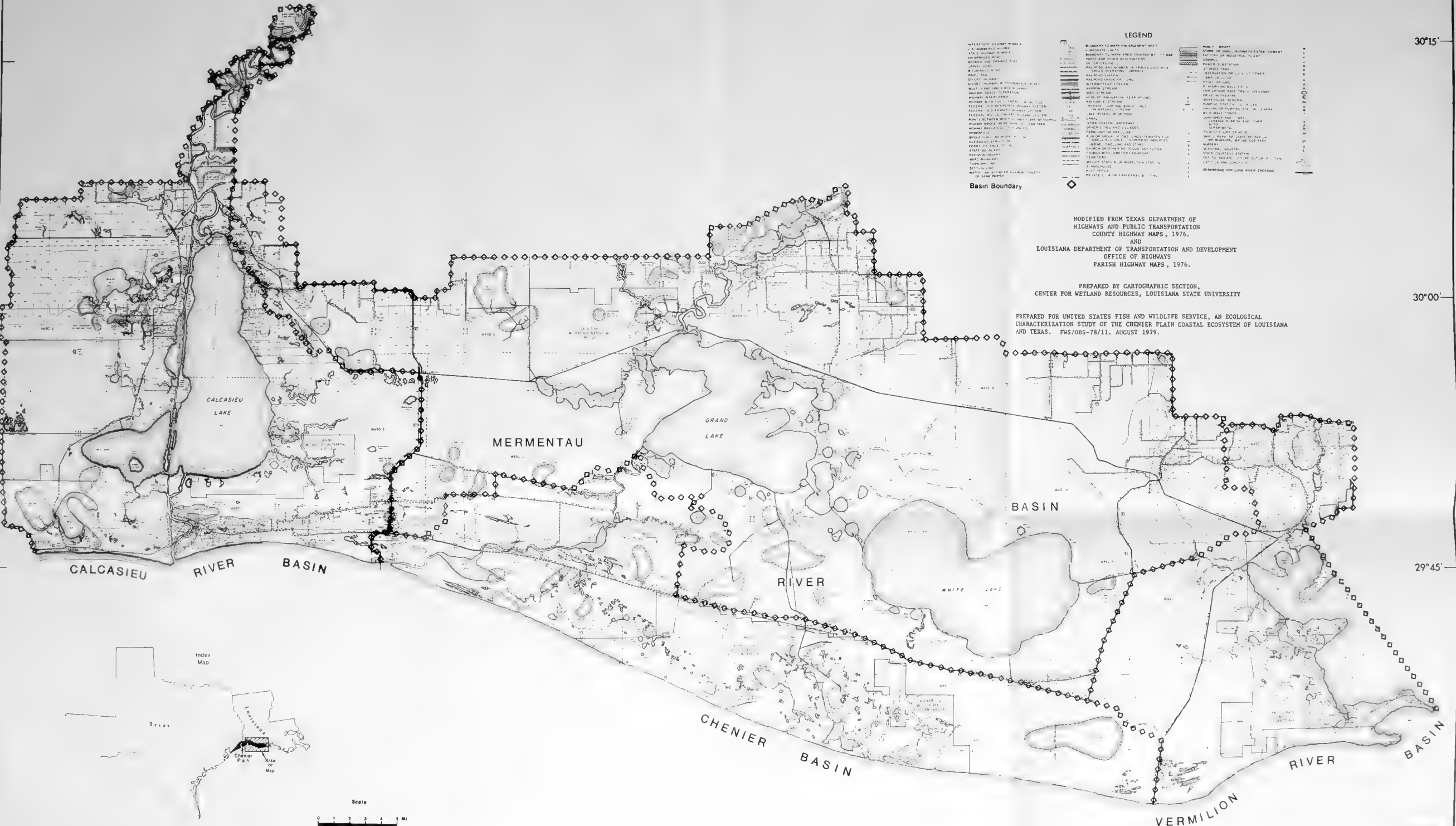
PLATE 1B INDEX MAP

30°15'

30°00'

29°45'

29°30'



LEGEND

INTERSTATE HIGHWAY ROUTE	BOUNDARY TO WETLAND MANAGEMENT UNIT	PUBLIC BOUNDARY
STATE HIGHWAY ROUTE	BOUNDARY TO WETLAND COVERED BY 1976 MAP	STATE OF TEXAS BOUNDARY WITH LOUISIANA
UNIMPROVED ROAD	BOUNDARY TO WETLAND COVERED BY 1976 MAP	FACTORY OR INDUSTRIAL PLANT
CRAGG AND TRAILER ROAD	PAVED ROAD NUMBER 1	ROAD
PAVED ROAD	PAVED ROAD NUMBER 2	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 3	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 4	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 5	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 6	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 7	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 8	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 9	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 10	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 11	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 12	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 13	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 14	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 15	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 16	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 17	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 18	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 19	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 20	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 21	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 22	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 23	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 24	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 25	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 26	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 27	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 28	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 29	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 30	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 31	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 32	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 33	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 34	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 35	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 36	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 37	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 38	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 39	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 40	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 41	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 42	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 43	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 44	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 45	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 46	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 47	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 48	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 49	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 50	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 51	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 52	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 53	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 54	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 55	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 56	PAVED ROAD
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GRAVEL ROAD	PAVED ROAD NUMBER 62	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 63	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 64	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 65	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 66	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 67	PAVED ROAD
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GRAVEL ROAD	PAVED ROAD NUMBER 70	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 71	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 72	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 73	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 74	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 75	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 76	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 77	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 78	PAVED ROAD
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GRAVEL ROAD	PAVED ROAD NUMBER 80	PAVED ROAD
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GRAVEL ROAD	PAVED ROAD NUMBER 82	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 83	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 84	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 85	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 86	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 87	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 88	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 89	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 90	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 91	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 92	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 93	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 94	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 95	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 96	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 97	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 98	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 99	PAVED ROAD
GRAVEL ROAD	PAVED ROAD NUMBER 100	PAVED ROAD

MODIFIED FROM TEXAS DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION COUNTY HIGHWAY MAPS, 1976. AND LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT OFFICE OF HIGHWAYS PARISH HIGHWAY MAPS, 1976.

PREPARED BY CARTOGRAPHIC SECTION, CENTER FOR WETLAND RESOURCES, LOUISIANA STATE UNIVERSITY

PREPARED FOR UNITED STATES FISH AND WILDLIFE SERVICE, AN ECOLOGICAL CHARACTERIZATION STUDY OF THE CHENIER PLAIN COASTAL ECOSYSTEM OF LOUISIANA AND TEXAS. FWS/OBS-78/11. AUGUST 1979.

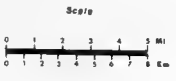








PLATE 3B
CHENIER PLAIN HABITAT GROUPS

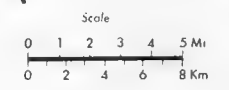
LEGEND

-  AQUATIC - permanently flooded, non-vegetated inland open water and nearshore Gulf habitats.
-  WETLANDS - periodically flooded lands characterized by emergent vegetation. See Plate 4
-  AGRICULTURE - cultivated cropland and improved pasture.
-  RIDGES AND UPLAND FOREST - naturally vegetated cheniers, levees, spoil banks, Pleistocene islands, and prairie surface.
-  URBAN - land areas developed for residential and industrial use.
-  BASIN BOUNDARY

PREPARED FROM UNITED STATES GEOLOGICAL SURVEY 1974-75, 1:24,000
ORTHOPHOTO QUADRANGLES, ADVANCED PRINTS.
NASA HIGH ALTITUDE FALSE COLOR INFRARED PHOTOGRAPHY
MISSION ZEPHYRUS 7, 1974.

PREPARED BY CARTOGRAPHIC SECTION,
CENTER FOR WETLAND RESOURCES, LOUISIANA STATE UNIVERSITY









PREPARED FOR UNITED STATES FISH AND WILDLIFE SERVICE, AN ECOLOGICAL
CHARACTERIZATION STUDY OF THE CHENIER PLAIN COASTAL ECOSYSTEM OF LOUISIANA
AND TEXAS. PHYCOS-78/11, AUGUST 1979.



30°15'
30°00'
29°45'
29°30'

93°30' 93°15' 93°00' 92°45' 92°30' 92°15' 92°00'

CHENIER PLAIN WETLAND HABITATS

-  NON-WETLAND HABITATS
-  SALT MARSH -saline intertidal marshes and associated small ponds, dominated by smooth cordgrass (*Spartina alterniflora*), with saltgrass (*Distichlis spicata*) and blackrush (*Juncus roemerianus*) common.
-  BRACKISH MARSH -intertidal marshes and associated small ponds dominated by saltmeadow cordgrass (*Spartina patens*) and saltgrass, salinities generally less than 10‰.
-  INTERMEDIATE MARSH -marshes and associated small ponds, periodically flooded with nearly fresh water, but occasionally by brackish water. Dominated by saltmeadow cordgrass, bulltongue (*Sagittaria falcata*), and leashore paspalum (*Paspalum vaginatum*).
-  FRESH MARSH -marshes flooded by fresh water, and with a diverse flora dominated by maidenpans (*Panicum hemitomon*), bulltongue, and alligatorweed (*Alternanthera philoxeroides*).
-  IMPOUNDED MARSH -marshes surrounded by dikes, spoil banks, or natural levees that modify normal flooding. These exist in saline to fresh areas. They may be permanently flooded or pumped dry, but all are dominated by native emergent wetland vegetation (as opposed to impounded agricultural land).
-  SWAMP FOREST -forested freshwater wetlands with diverse flora dominated by baldcypress (*Taxodium distichum*) and tupelo (*Nyssa aquatica*).
-  BASIN BOUNDARY

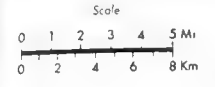
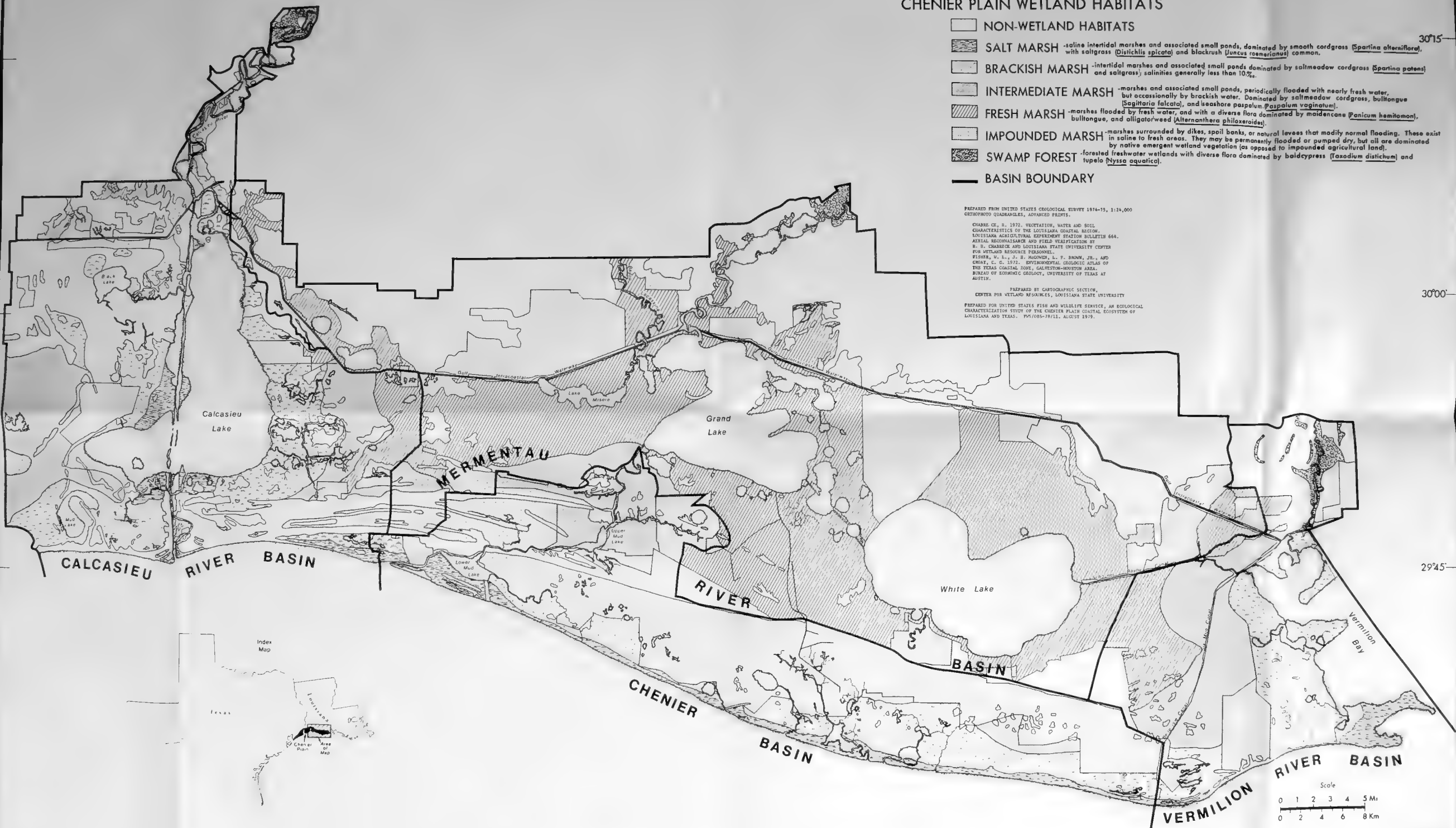
PREPARED FROM UNITED STATES GEOLOGICAL SURVEY 1974-75, 1:25,000
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CHABRE, C. R. 1972. VEGETATION, WATER AND SOIL
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FISHER, W. L., J. H. MOONEN, L. P. BROWN, JR., AND
 CHAFF, C. C. 1972. ENVIRONMENTAL GEOLOGIC ATLAS OF
 THE TEXAS COASTAL ZONE, GALVESTON-HOUSTON AREA.
 BUREAU OF ECONOMIC GEOLOGY, UNIVERSITY OF TEXAS AT
 AUSTIN.

PREPARED BY CARTOGRAPHIC SECTION,
 CENTER FOR WETLAND RESOURCES, LOUISIANA STATE UNIVERSITY

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 LOUISIANA AND TEXAS. 75/085-78/11, AUGUST 1978.



93°30' 93°15' 93°00' 92°45' 92°30' 92°15' 92°00'

30°15' 30°00' 29°45' 29°30'

PLATE 5B
CANALS AND POINT SOURCE DISCHARGES
LEGEND

30°15'

- INDUSTRIAL AND MUNICIPAL POINT SOURCE DISCHARGES**
- ① AMOCO PROD. CO.
 - ② GULF PROD. CO.
 - ③ STEED FISH CO.
 - ④ ZAPATA PROTEIN
 - ⑤ GULF MENHADEN CO.
 - ⑥ LOUISIANA MENHADEN CO.
 - ⑦ HUNT OIL CO.
 - ⑧ AMOCO PROD. CO.
 - ⑨ TEXAS PACIFIC OIL-CRUDE PROD.
 - ⑩ AMOCO PROD. CO.
 - ⑪ OLIN CORP.-BRINE PROD.
 - ⑫ SHELL OIL-CRUDE PROD.
 - ⑬ AMOCO PROD. CO.
 - ⑭ TEXACO-WELLS
 - ⑮ AMOCO PROD. CO.
 - ⑯ GULF OIL-WELLS
 - ⑰ AMOCO PROD. CO.

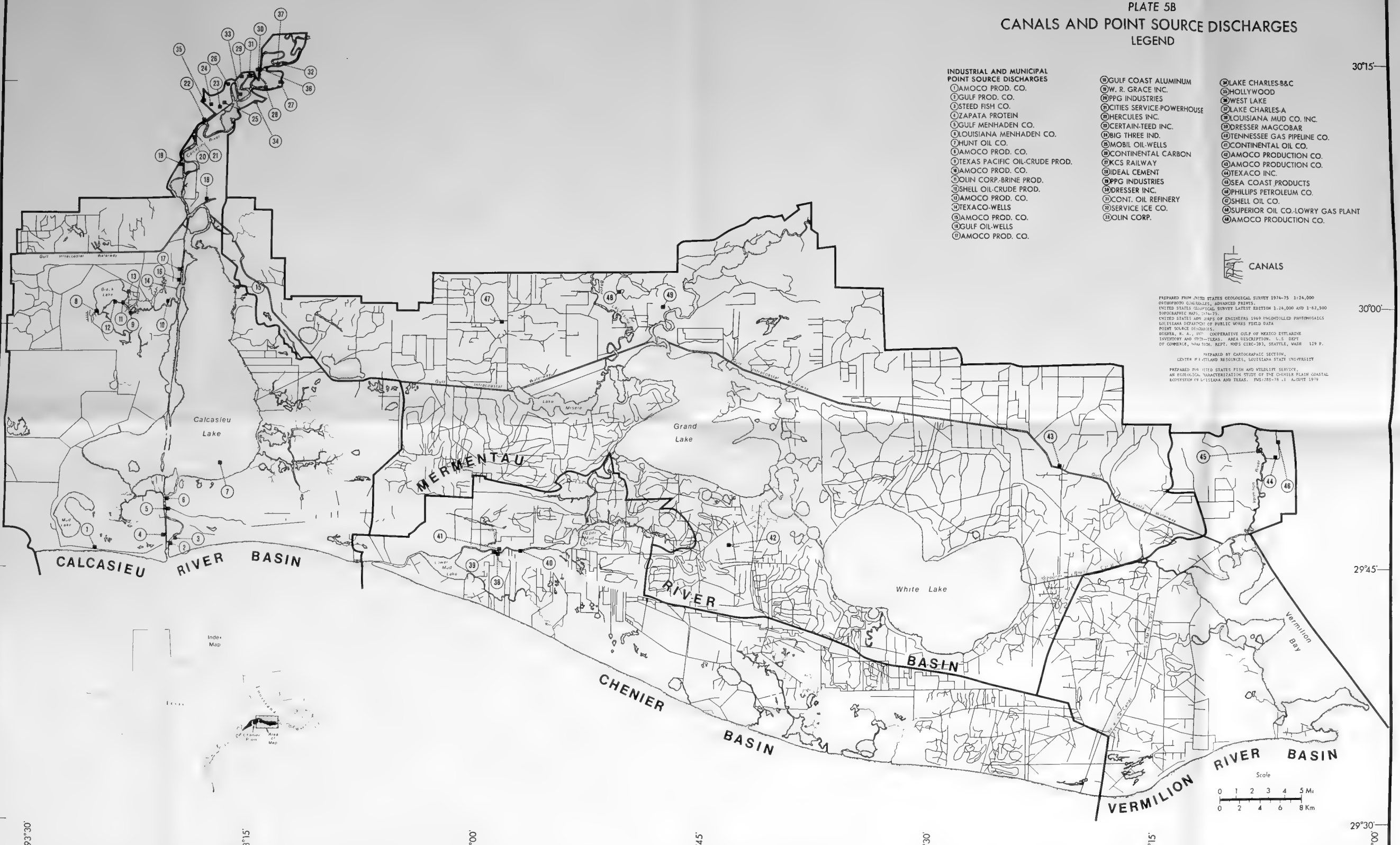
- ⑱ GULF COAST ALUMINUM
- ⑲ W. R. GRACE INC.
- ⑳ PPG INDUSTRIES
- ㉑ CITIES SERVICE-POWERHOUSE
- ㉒ HERCULES INC.
- ㉓ CERTAIN-TEED INC.
- ㉔ BIG THREE IND.
- ㉕ MOBIL OIL-WELLS
- ㉖ CONTINENTAL CARBON
- ㉗ KCS RAILWAY
- ㉘ IDEAL CEMENT
- ㉙ PPG INDUSTRIES
- ㉚ DRESSER INC.
- ㉛ CONT. OIL REFINERY
- ㉜ SERVICE ICE CO.
- ㉝ OLIN CORP.

- ②⑥ LAKE CHARLES-B&C
- ②⑦ HOLLYWOOD
- ②⑧ WEST LAKE
- ②⑨ LAKE CHARLES-A
- ②⑩ LOUISIANA MUD CO. INC.
- ②⑪ DRESSER MAGCOBAR
- ②⑫ TENNESSEE GAS PIPELINE CO.
- ②⑬ CONTINENTAL OIL CO.
- ②⑭ AMOCO PRODUCTION CO.
- ②⑮ AMOCO PRODUCTION CO.
- ②⑯ TEXACO INC.
- ②⑰ SEA COAST PRODUCTS
- ②⑱ PHILLIPS PETROLEUM CO.
- ②⑲ SHELL OIL CO.
- ②⑳ SUPERIOR OIL CO.-LOWRY GAS PLANT
- ㉑① AMOCO PRODUCTION CO.

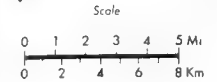


PREPARED FROM UNITED STATES GEOLOGICAL SURVEY 1974-75 1:24,000
ORTHOPHOTO QUADANGLES, ADVANCED PRINTS
UNITED STATES GEOLOGICAL SURVEY LATEST EDITION 1:24,000 AND 1:62,500
TOPOGRAPHIC MAPS, 1974-75
UNITED STATES ARMY CORPS OF ENGINEERS 1969 UNCONTROLLED PHOTOSTATICS
LOUISIANA DEPARTMENT OF PUBLIC WORKS FIELD DATA
POINT SOURCE DISCHARGES
BEIDER, R. A., 1971 COOPERATIVE GULF OF MEXICO ESTUARINE
INVENTORY AND STUDY-TEXAS. AREA DESCRIPTION. U.S. DEPT.
OF COMMERCE, WASHINGTON, REPT. NOS. 212-393, SEATTLE, WASH. 119 P.
PREPARED BY CARTOGRAPHIC SECTION,
CENTER FOR ISLAND RESOURCES, LOUISIANA STATE UNIVERSITY
PREPARED FOR UNITED STATES FISH AND WILDLIFE SERVICE,
AN ECOLOGICAL CHARACTERIZATION STUDY OF THE CHENIER PLAIN COASTAL
ECOSYSTEM OF LOUISIANA AND TEXAS. PHOTO-18-11 AUGUST 1979

30°00'



29°45'



29°30'

93°30'

93°15'

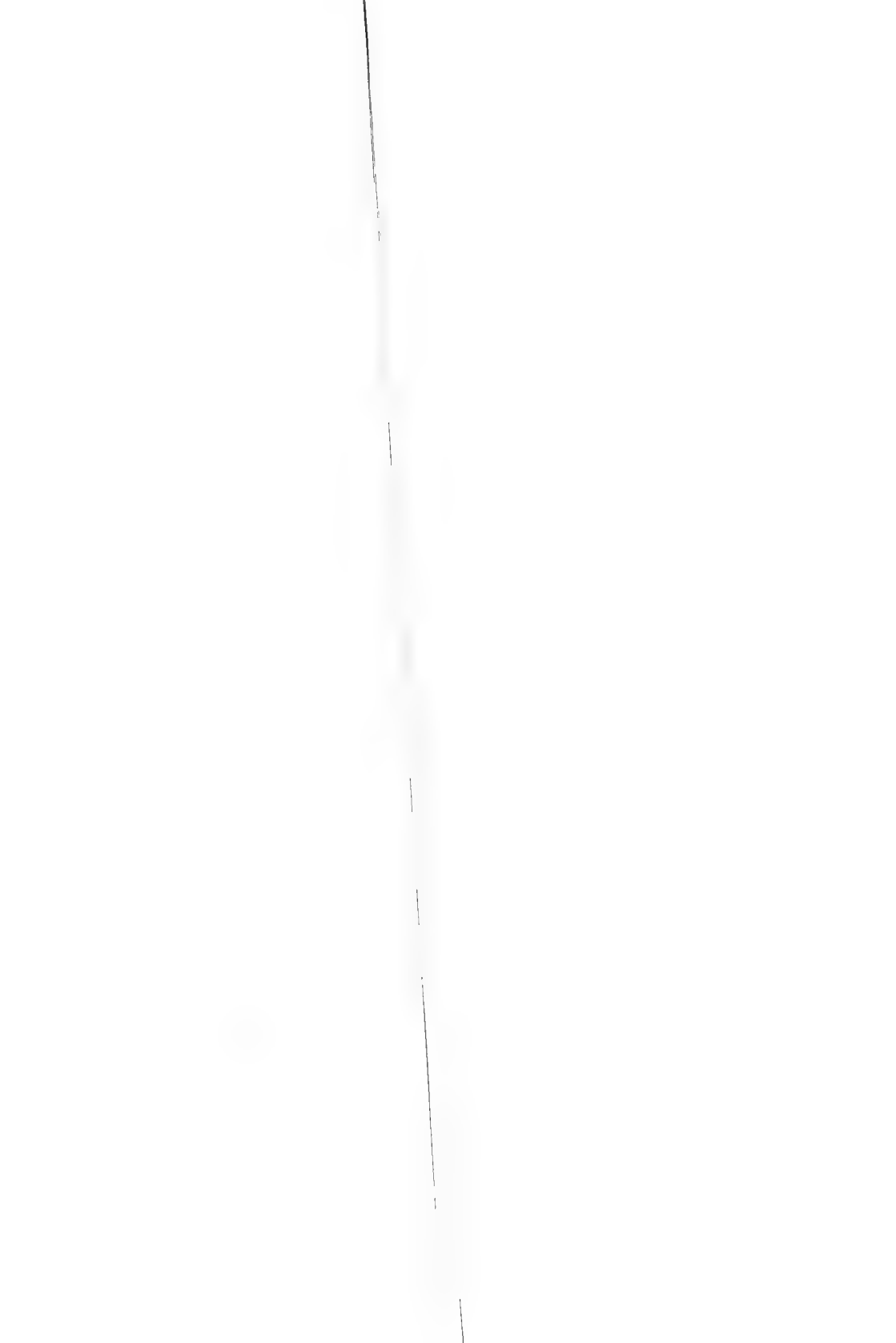
93°00'

92°45'

92°30'

92°15'

92°00'



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SYSTEM OF LOUISIANA
Atlas.

I L. Cordes and

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(FWS/OBS-78/10)

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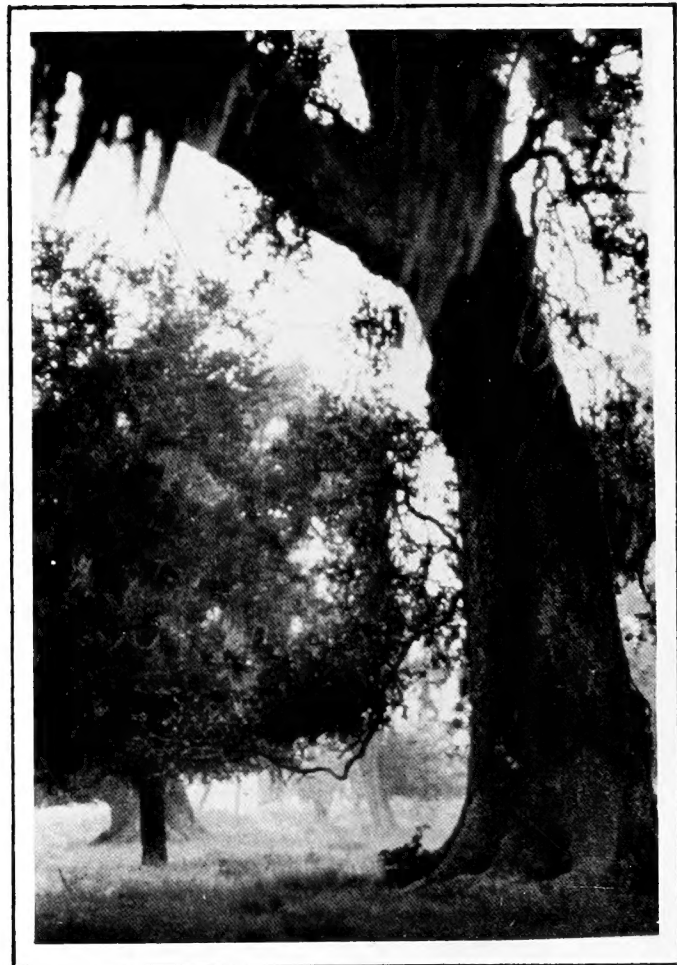
Biological Services Program

FWS/OBS-78/11
August 1979



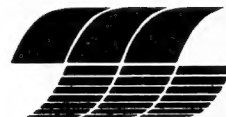
An Ecological Characterization Study of the Chenier Plain Coastal Ecosystem of Louisiana and Texas

VOLUME III ATLAS



Interagency Energy-Environment Research and Development Program

OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
AND
Fish and Wildlife Service



U.S. Department of the Interior



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