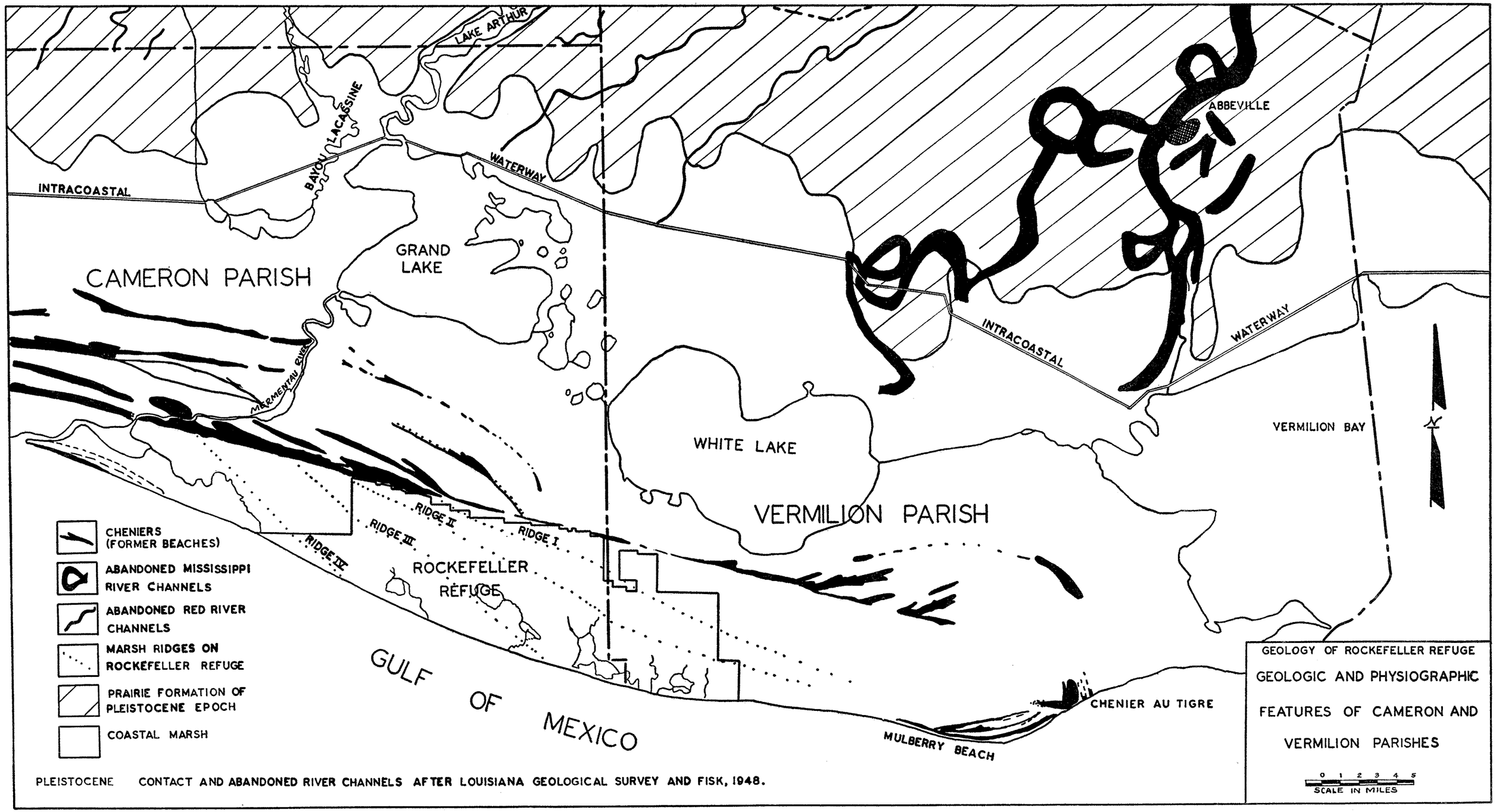


PLATE II

839-B

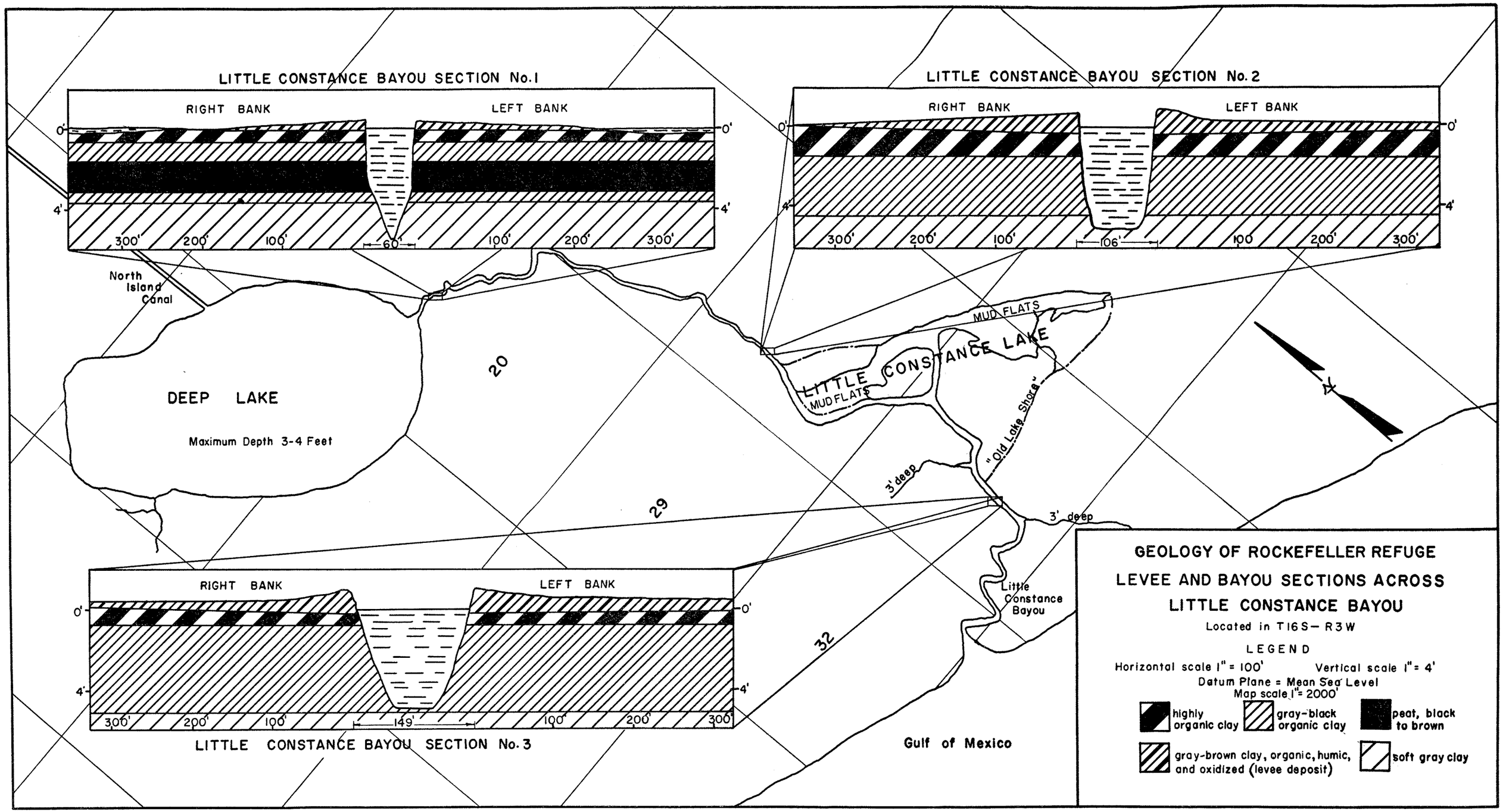


PLATE III

839-B

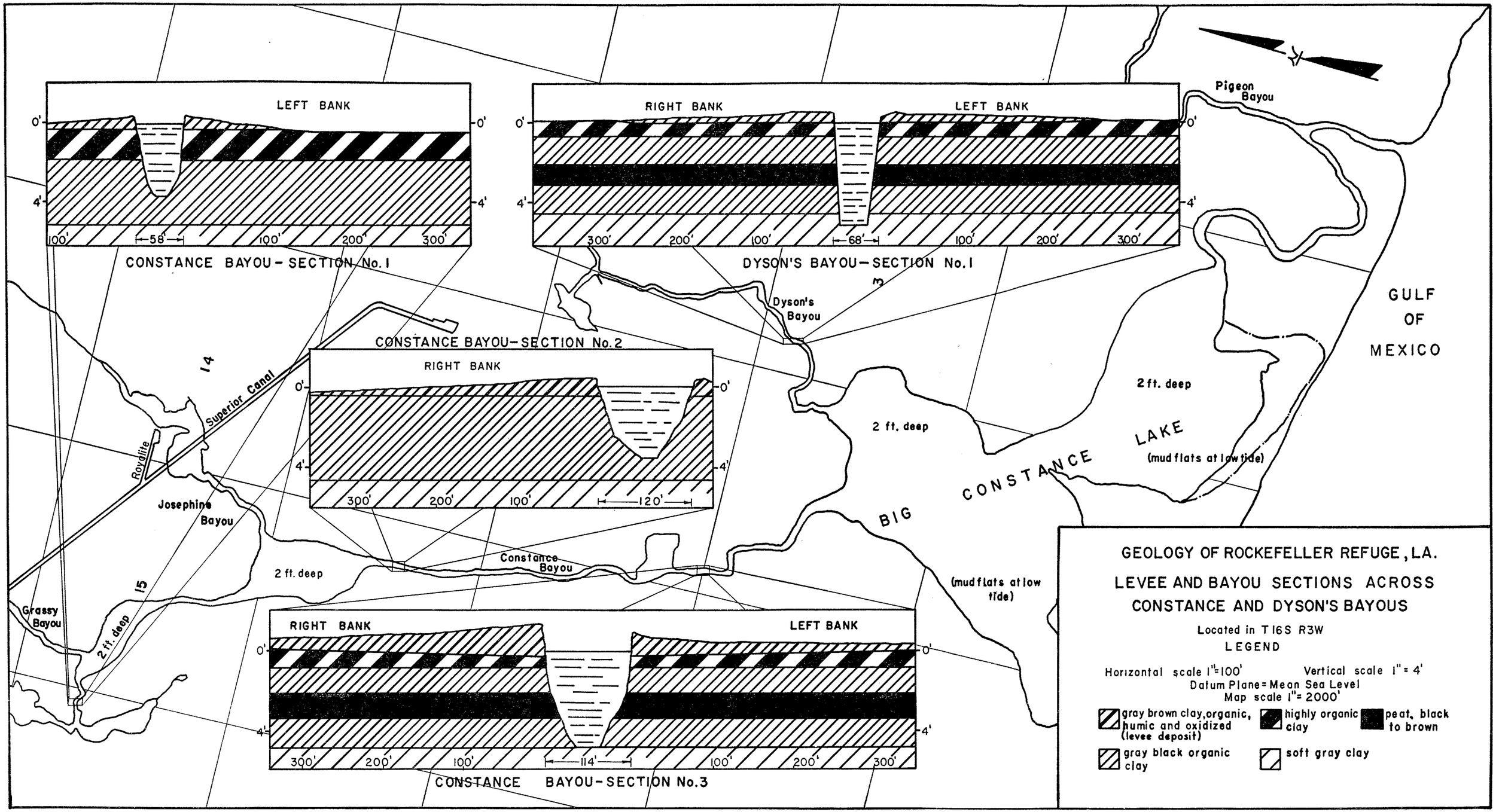
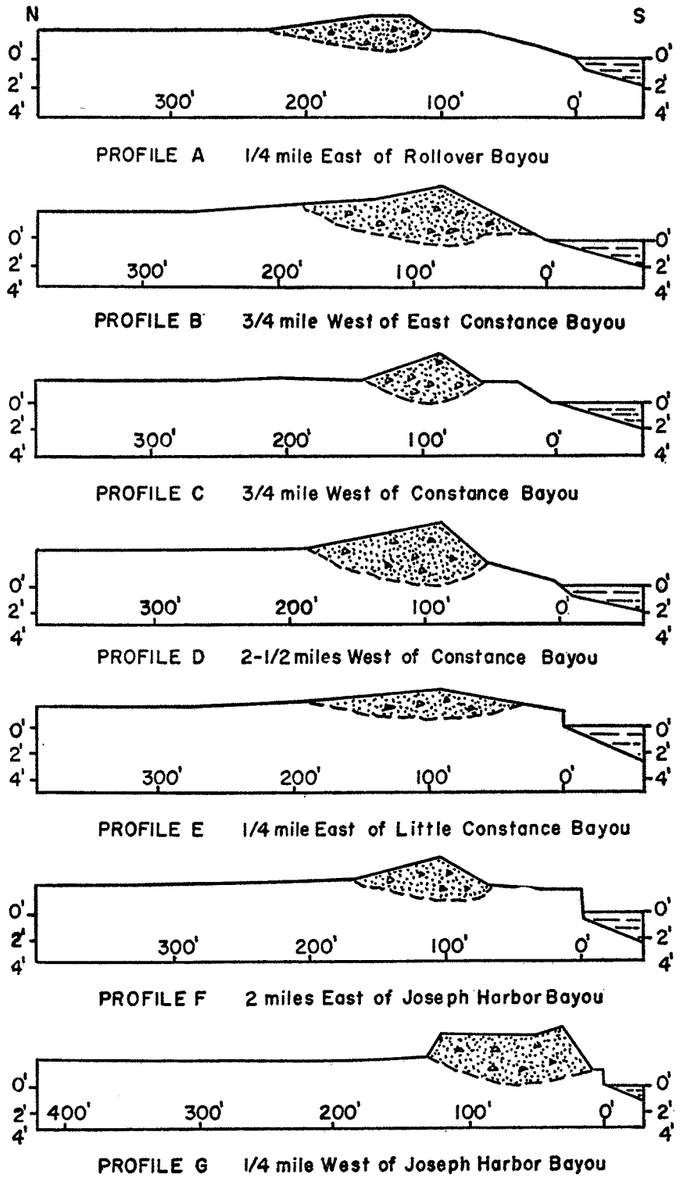
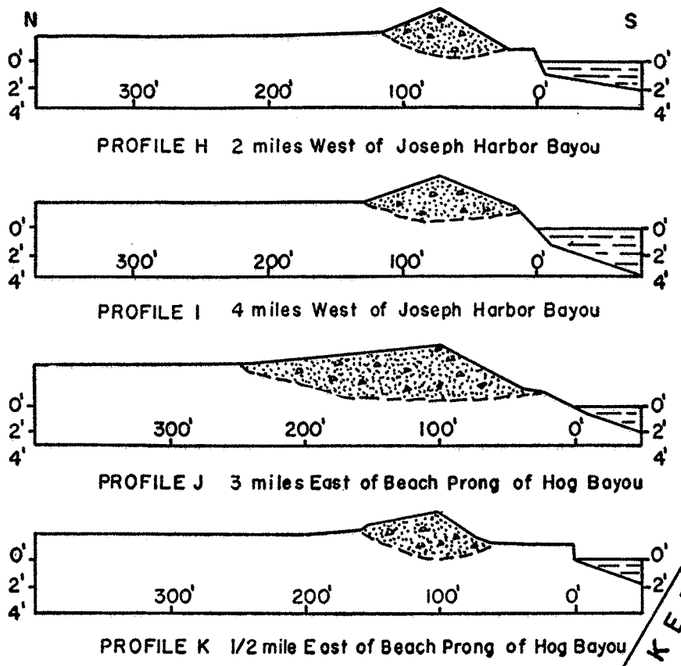
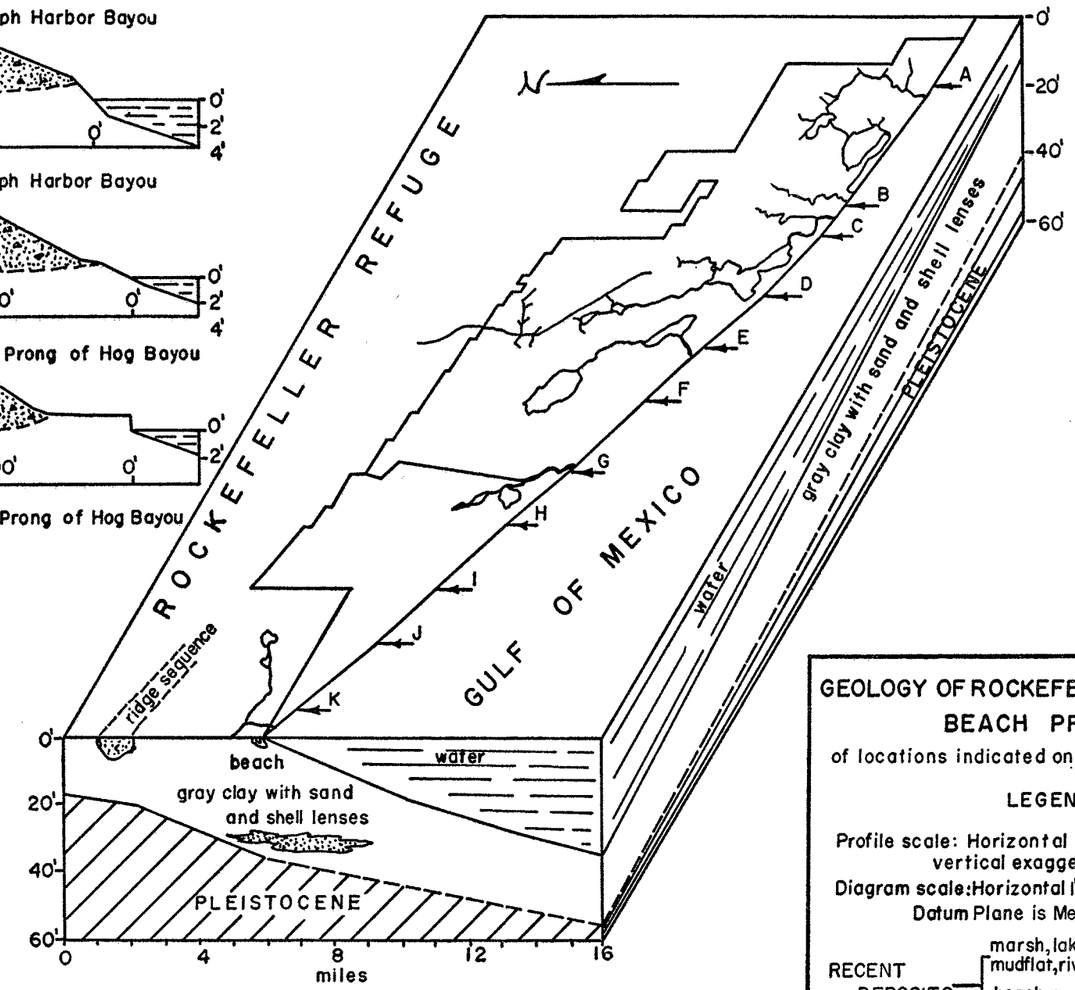


PLATE IV

839-B







GEOLOGY OF ROCKEFELLER REFUGE, LA.
BEACH PROFILES

of locations indicated on block diagram of Refuge

LEGEND

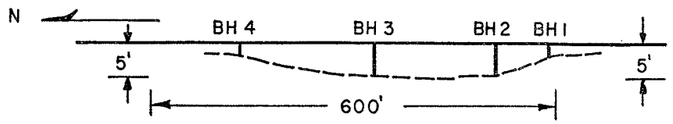
Profile scale: Horizontal 1"=100' Vertical 1"=10'
vertical exaggeration 10 times
Diagram scale: Horizontal 1½=4 miles Vertical 1"=40'
Datum Plane is Mean Sea Level

RECENT DEPOSITS
- marsh, lake, mudflat, river — gray clay with organic material
- beach, river, near shore bay-bottom — sand and shell

PLEISTOCENE DEPOSITS
- undifferentiated — gray, silty clay deeply oxidized

PLATE V

839-B

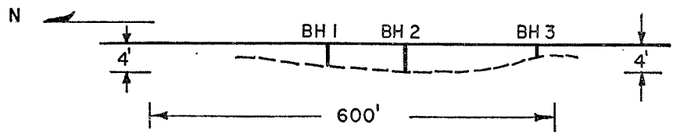


RIDGE Ia

See Location Map (Plate I)

Cross Section Located in Sec 5 T16S R2W

Maximum Elevation above Marsh Level = 0.3'

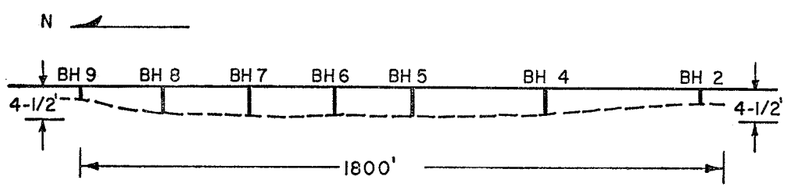


RIDGE Ib

See Location Map (Plate I)

Cross Section Located in Sec 12 T16S R3W

Maximum Elevation above Marsh Level = 0.4'

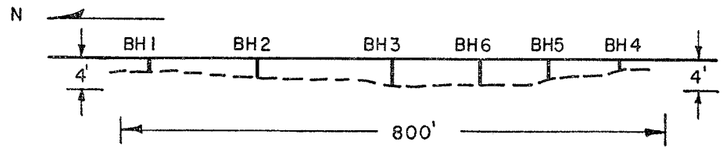


RIDGE IIIa

See Location Map (Plate I)

Cross Section Located in Sec30 T15 S R4W

Maximum Elevation above Marsh Level = 0.4'

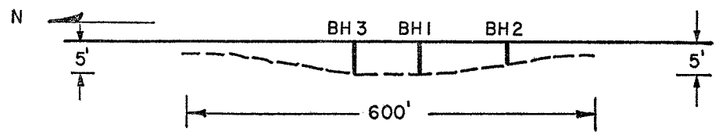


RIDGE IIa

See Location Map (Plate I)

Cross Section Located in Sec 19 T15S R4W

Maximum Elevation above Marsh Level = 0.3'

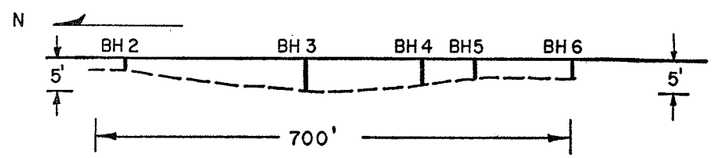


RIDGE IIb

See Location Map (Plate I)

Cross Section Located in Sec 27 T15S R4W

Maximum Elevation above Marsh Level = 0.35'

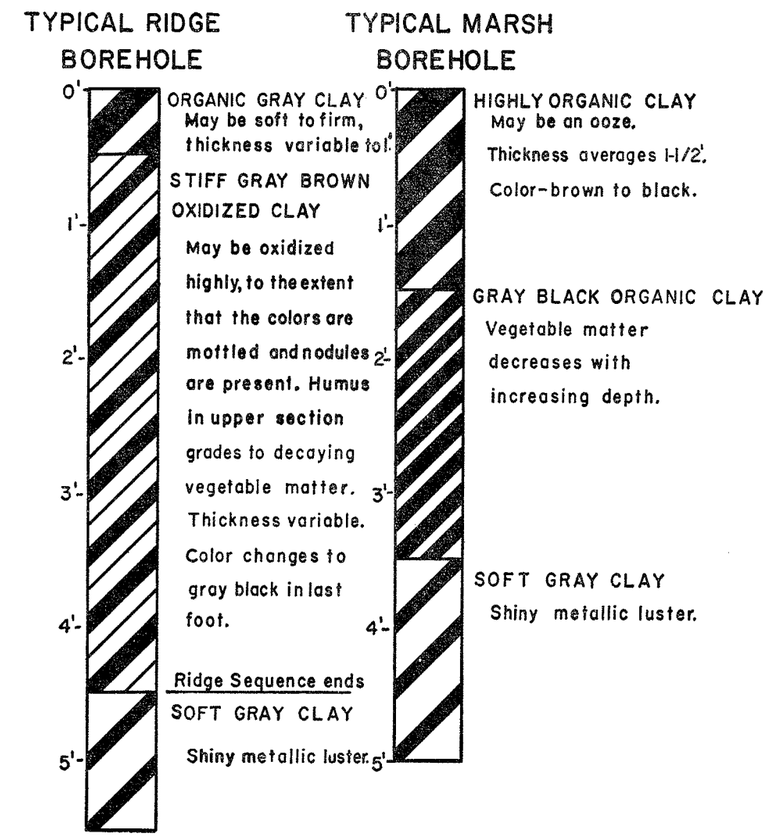


RIDGE IIIb

See Location Map (Plate I)

Cross Section Located in Sec 4 T16S R4W

Maximum Elevation above Marsh Level = 0.2'



GEOLOGY OF ROCKEFELLER REFUGE, LA.

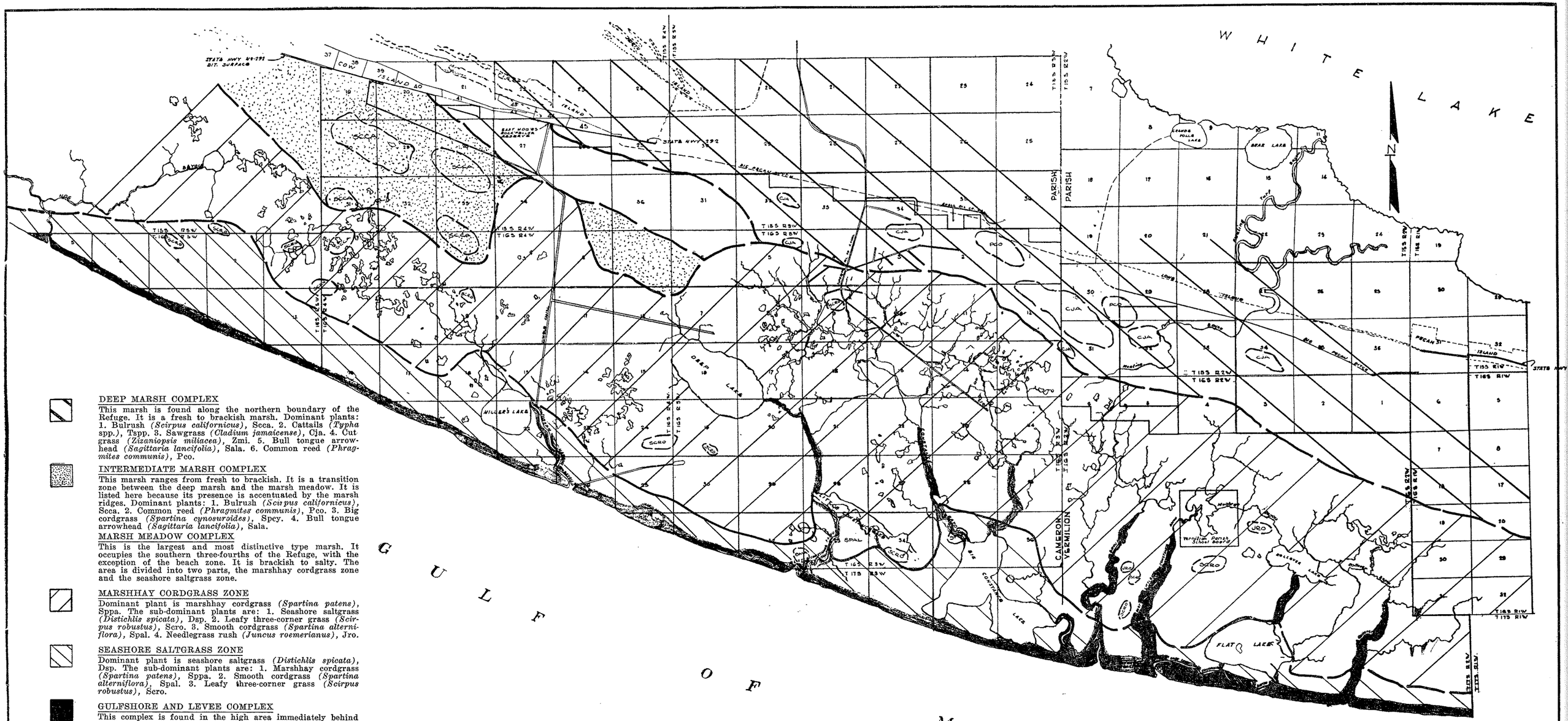
CROSS SECTIONS OF MARSH RIDGES WITH TYPICAL RIDGE AND MARSH SEQUENCE OF DEPOSITS

LEGEND

- Ground Surface Line
- Base of Ridge
- BH — Borehole Location
- 700' — Width of Ridge
- 4' — Thickness of Ridge

All cross sections taken at right angles to course of Ridge

Ridge elevation above Marsh level is listed beneath each cross section



DEEP MARSH COMPLEX

This marsh is found along the northern boundary of the Refuge. It is a fresh to brackish marsh. Dominant plants: 1. Bulrush *(Scirpus californicus)*, Scca. 2. Cattails *(Typha* spp.), Tspp. 3. Sawgrass *(Cladium jamaicense)*, Cja. 4. Cut grass *(Zizaniopsis miliacea)*, Zmi. 5. Bull tongue arrowhead *(Sagittaria lancifolia)*, Sala. 6. Common reed *(Phragmites communis)*, Pco.

INTERMEDIATE MARSH COMPLEX

This marsh ranges from fresh to brackish. It is a transition zone between the deep marsh and the marsh meadow. It is listed here because its presence is accentuated by the marsh ridges. Dominant plants: 1. Bulrush *(Scirpus californicus)*, Scca. 2. Common reed *(Phragmites communis)*, Pco. 3. Big cordgrass *(Spartina cynosuroides)*, Spcy. 4. Bull tongue arrowhead *(Sagittaria lancifolia)*, Sala.

MARSH MEADOW COMPLEX

This is the largest and most distinctive type marsh. It occupies the southern three-fourths of the Refuge, with the exception of the beach zone. It is brackish to salty. The area is divided into two parts, the marshhay cordgrass zone and the seashore saltgrass zone.

MARSHHAY CORDGRASS ZONE

Dominant plant is marshhay cordgrass *(Spartina patens)*, Sppa. The sub-dominant plants are: 1. Seashore saltgrass *(Distichlis spicata)*, Dsp. 2. Leafy three-corner grass *(Scirpus robustus)*, Scro. 3. Smooth cordgrass *(Spartina alterniflora)*, Spal. 4. Needlegrass rush *(Juncus roemerianus)*, Jro.

SEASHORE SALTGRASS ZONE

Dominant plant is seashore saltgrass *(Distichlis spicata)*, Dsp. The sub-dominant plants are: 1. Marshhay cordgrass *(Spartina patens)*, Sppa. 2. Smooth cordgrass *(Spartina alterniflora)*, Spal. 3. Leafy three-corner grass *(Scirpus robustus)*, Scro.

GULFSHORE AND LEVEE COMPLEX

This complex is found in the high area immediately behind the beach, on bayou levees, lake shores, and along old canal levees. Dominant plants: 1. Bigleaf sumpweed *(Iva frutescens)*, Ifr. 2. Sea-oxeye *(Borrichia frutescens)*, Bfr. 3. Saltwort *(Batis maritima)*, Bma. Big cordgrass *(Spartina cynosuroides)*, Spcy. 5. Smooth cordgrass *(Spartina alterniflora)*, Spal. 6. Seashore saltgrass *(Distichlis spicata)*, Dsp.

SALTWATER INTRUSION AREA

The vegetation in this area was destroyed by excessive saltwater. This was formerly a deep marsh area. It is undergoing changes at present.

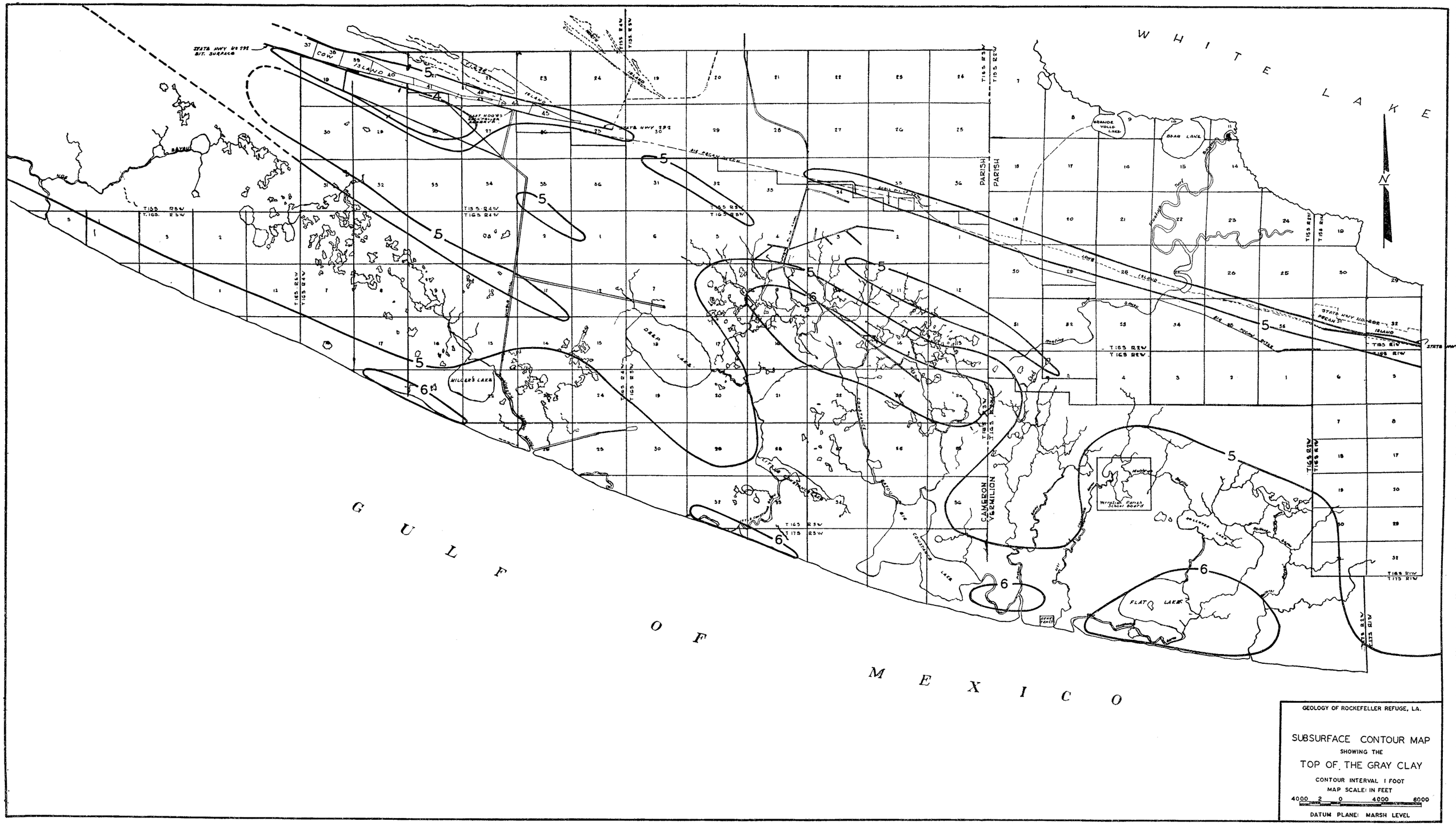
NOTE: Within the major zones stated above occasional pure stands or dense concentrations of certain type plants have been mapped. These are indicated by circling the areas and placing the initials of the scientific names within the circles.

GEOLOGY OF ROCKEFELLER REFUGE, LA.

VEGETATION TYPE MAP OF ROCKEFELLER REFUGE

MAP SCALE: IN FEET

4000 2 0 4000 8000

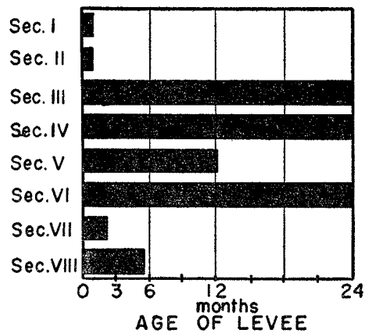


GEOLOGY OF ROCKEFELLER REFUGE, LA.

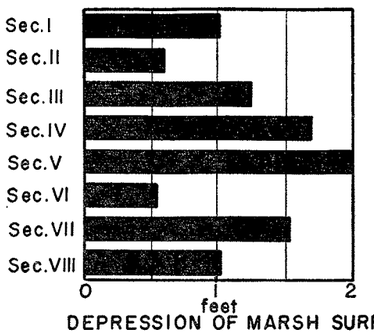
SUBSURFACE CONTOUR MAP
SHOWING THE
TOP OF THE GRAY CLAY

CONTOUR INTERVAL 1 FOOT
MAP SCALE: IN FEET
4000 2 0 4000 8000
DATUM PLANE: MARSH LEVEL

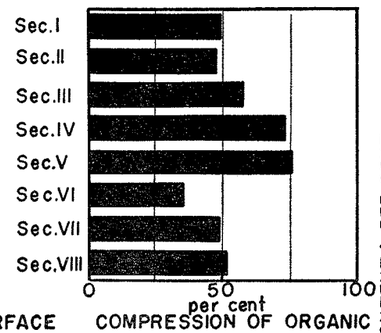
PLATE VIII



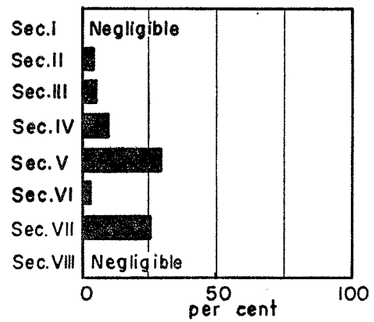
AGE OF LEVEE



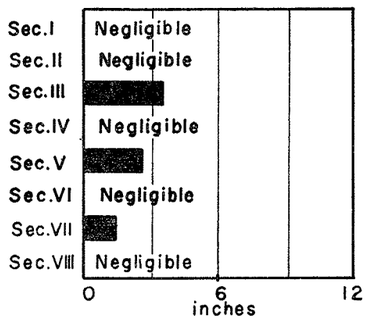
DEPRESSION OF MARSH SURFACE



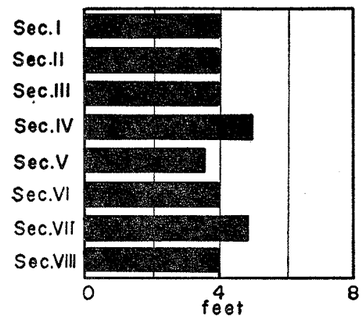
COMPRESSION OF ORGANIC LAYER



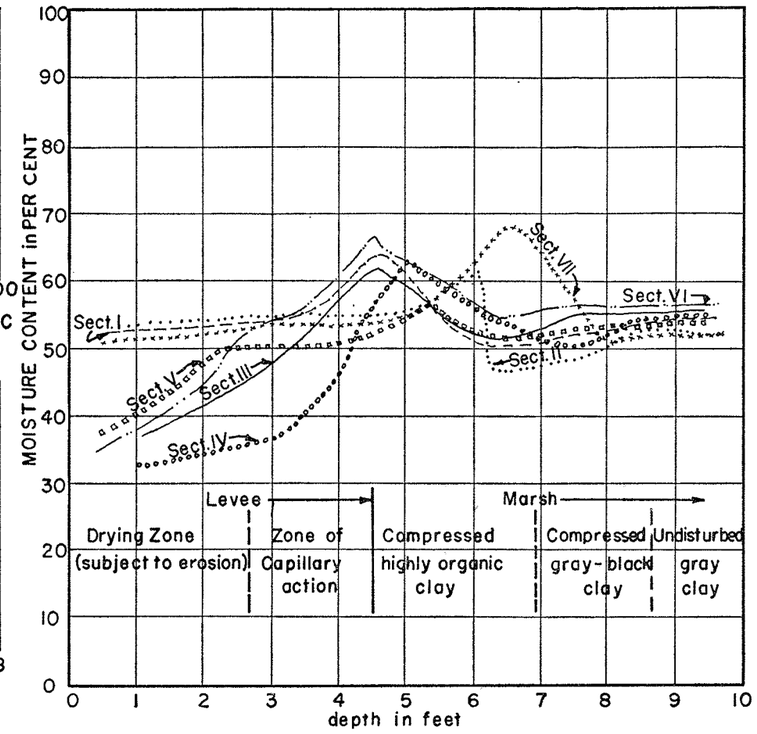
COMPRESSION OF GRAY-BLACK CLAY



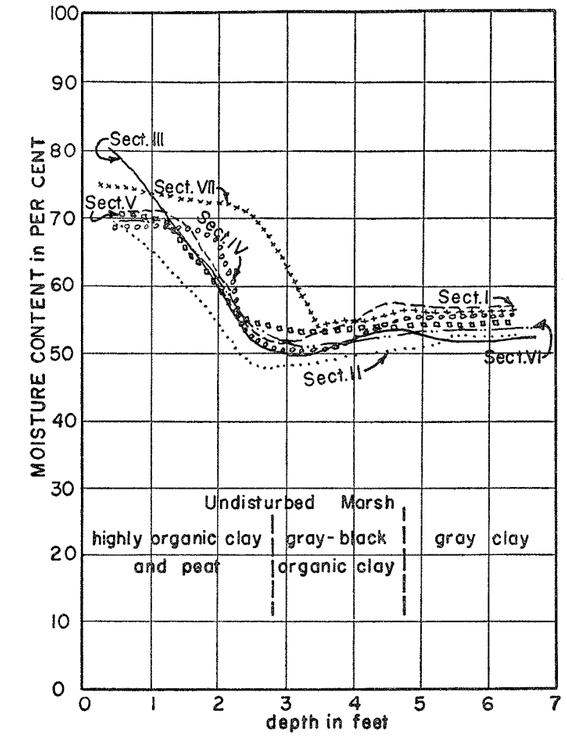
DEPRESSION OF UPPER CONTACT OF GRAY CLAY



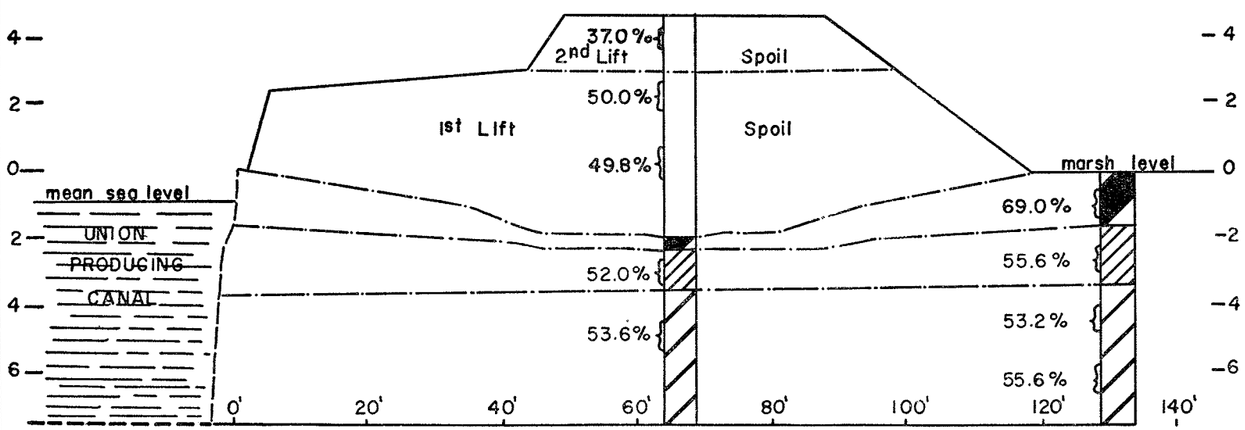
DEPTH TO GRAY CLAY



MOISTURE CONTENT VERSUS DEPTH BASED ON BORINGS THROUGH LEVEE AND INTO UNDERLYING MARSH



MOISTURE CONTENT VERSUS DEPTH BASED ON BORINGS ADJACENT TO LEVEES IN UNDISTURBED MARSH



SECTION V- NORTH LEVEE OF UNION PRODUCING CANAL
1/2 MILE EAST OF HUMBLE CANAL

LOCATION OF SECTIONS
(For exact location- see Plate no. I)

SECTION I - New Headquarters Canal—near Humble Canal.
SECTION II - New Headquarters Canal-1 mile West of Humble Canal.
SECTION III - Humble Canal-on East-West Section.
SECTION IV - Humble Canal-South of Union Producing Canal.
SECTION V - Union Producing Canal-1/2 mile East of Humble Canal.
SECTION VI - Superior Canal-1 mile South of Refuge boundary.
SECTION VII - Superior Canal-1/4 mile from South end.
SECTION VIII - New Headquarters Canal- Section I rechecked.

GEOLOGY OF ROCKEFELLER REFUGE, LA.
CANAL LEVEE STUDY

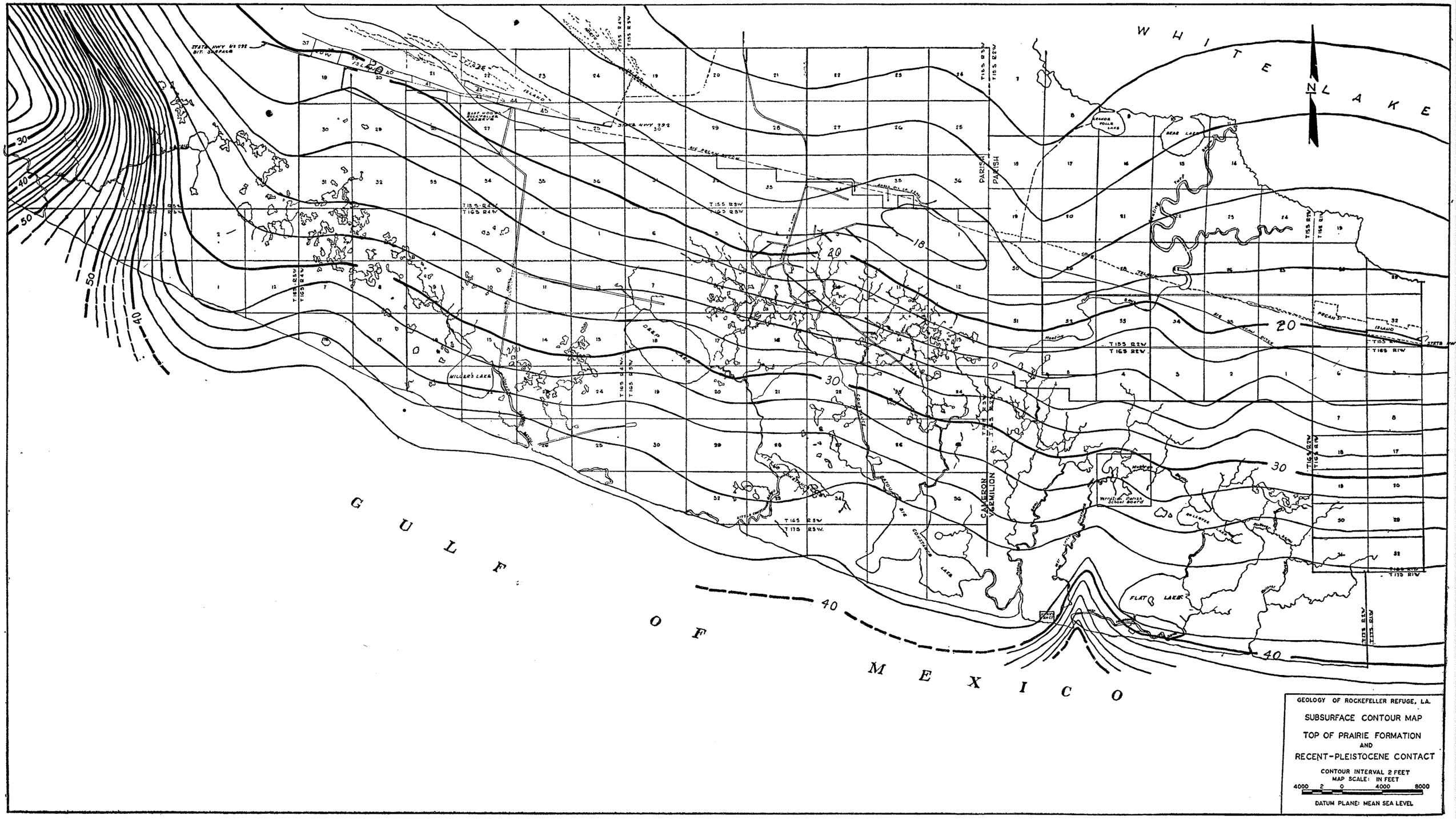
A comparative study of signifigant data from 8 canal levee cross sections, including a moisture content analysis of levees, marsh compressed by levees, and undisturbed marsh. One cross section is presented to illustrate salient features.

CROSS SECTION LEGEND

Horizontal scale 1"=20' Vertical scale 1"=4'
Datum Plane is at marsh level

- levee or spoil
- highly organic clay (organic layer)
- gray-black organic clay
- gray clay

Percentage figures indicate moisture content



GEOLOGY OF ROCKEFELLER REFUGE, LA.

SUBSURFACE CONTOUR MAP

TOP OF PRAIRIE FORMATION

AND

RECENT-PLEISTOCENE CONTACT

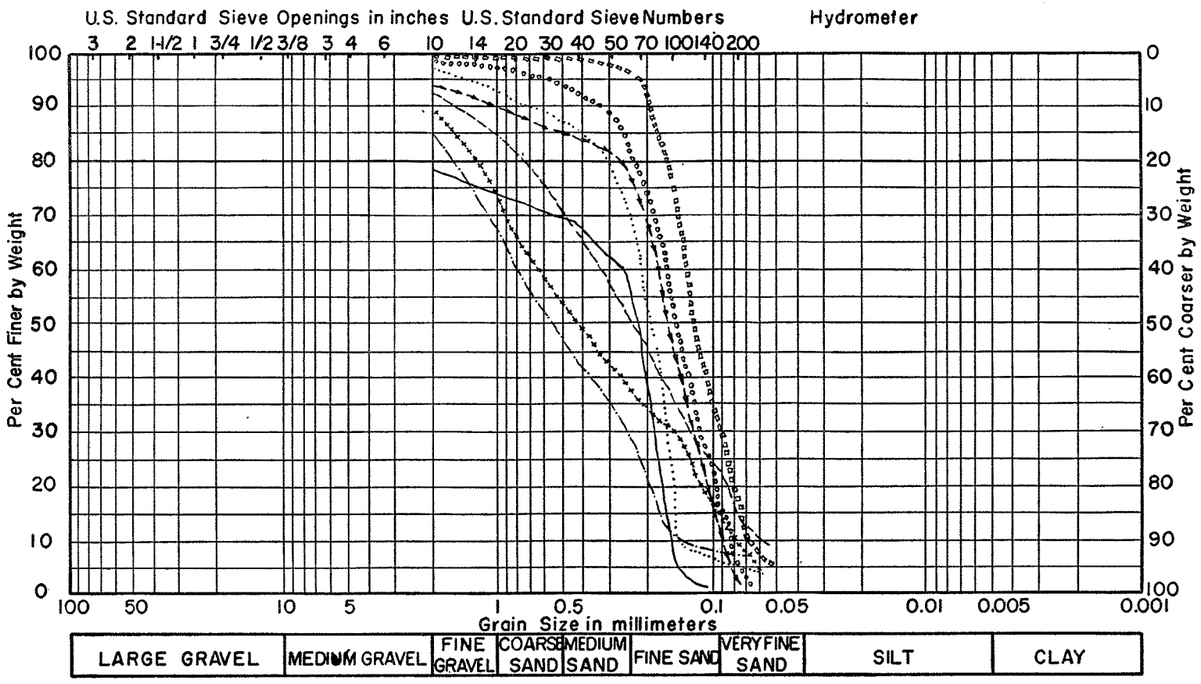
CONTOUR INTERVAL 2 FEET

MAP SCALE: IN FEET

4000 2 0 4000 8000

DATUM PLANE: MEAN SEA LEVEL

PLATE X



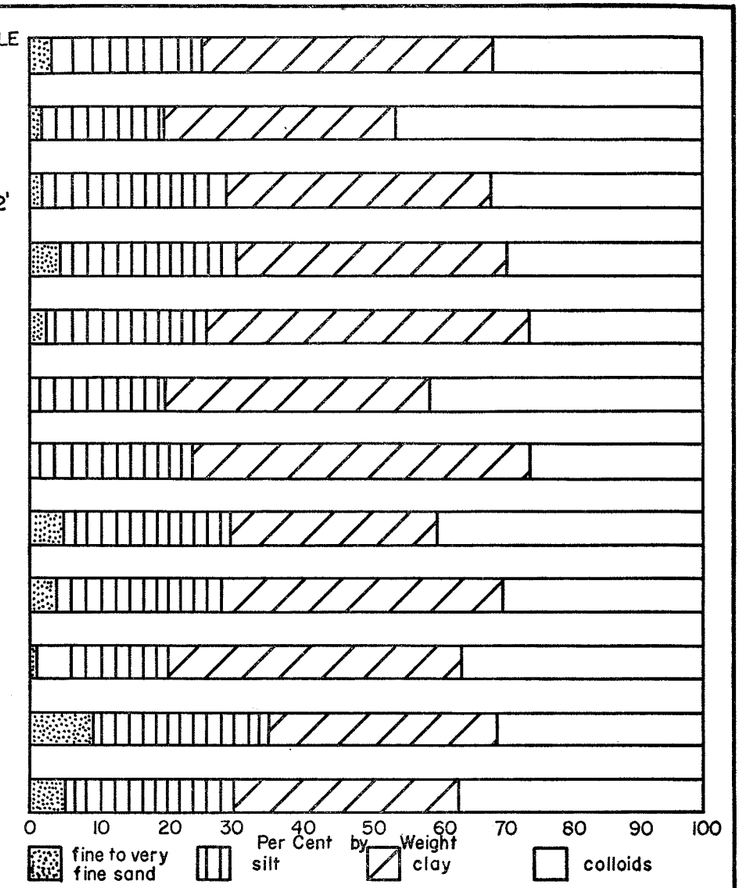
U.S. Bureau of Soils Classification

ANALYSIS OF BEACH MATERIAL

(see Plate V for comparison of locations)

BEACH PROFILE	D	Cameron-Vermilion Parish Line	(Low tide swash line)	10 % Shell
BEACH PROFILE	E	1/4 mile East of Little Constance Bayou	(Low tide swash line)	16 % Shell
BEACH PROFILE	F	2 miles East of Joseph Harbor Bayou	(Low tide swash line)	11 % Shell
BEACH PROFILE	H	2 miles West of Joseph Harbor Bayou	(Low tide swash line)	5 % Shell
BEACH PROFILE	I	4 miles West of Joseph Harbor Bayou	(High tide swash line)	7 % Shell
BEACH PROFILE	I	4 miles West of Joseph Harbor Bayou	(Low tide swash line)	3 % Shell
BEACH PROFILE	K	1/4 mile East of Beach Prong of Hog Bayou	(Low tide swash line)	
COW ISLAND		100 feet South of Northwest corner of Refuge (depth 4 feet)		20% Shell

GRAIN SIZE ANALYSIS — BEACH SEDIMENTS



U.S. BUREAU OF SOILS CLASSIFICATION

GRAIN SIZE ANALYSIS — MARSH RIDGE, MARSH & LEVEE SEDIMENTS

GEOLOGY OF ROCKEFELLER REFUGE, LA.

GRAIN SIZE ANALYSIS

BEACH SEDIMENTS

Represented by Cumulative Curves

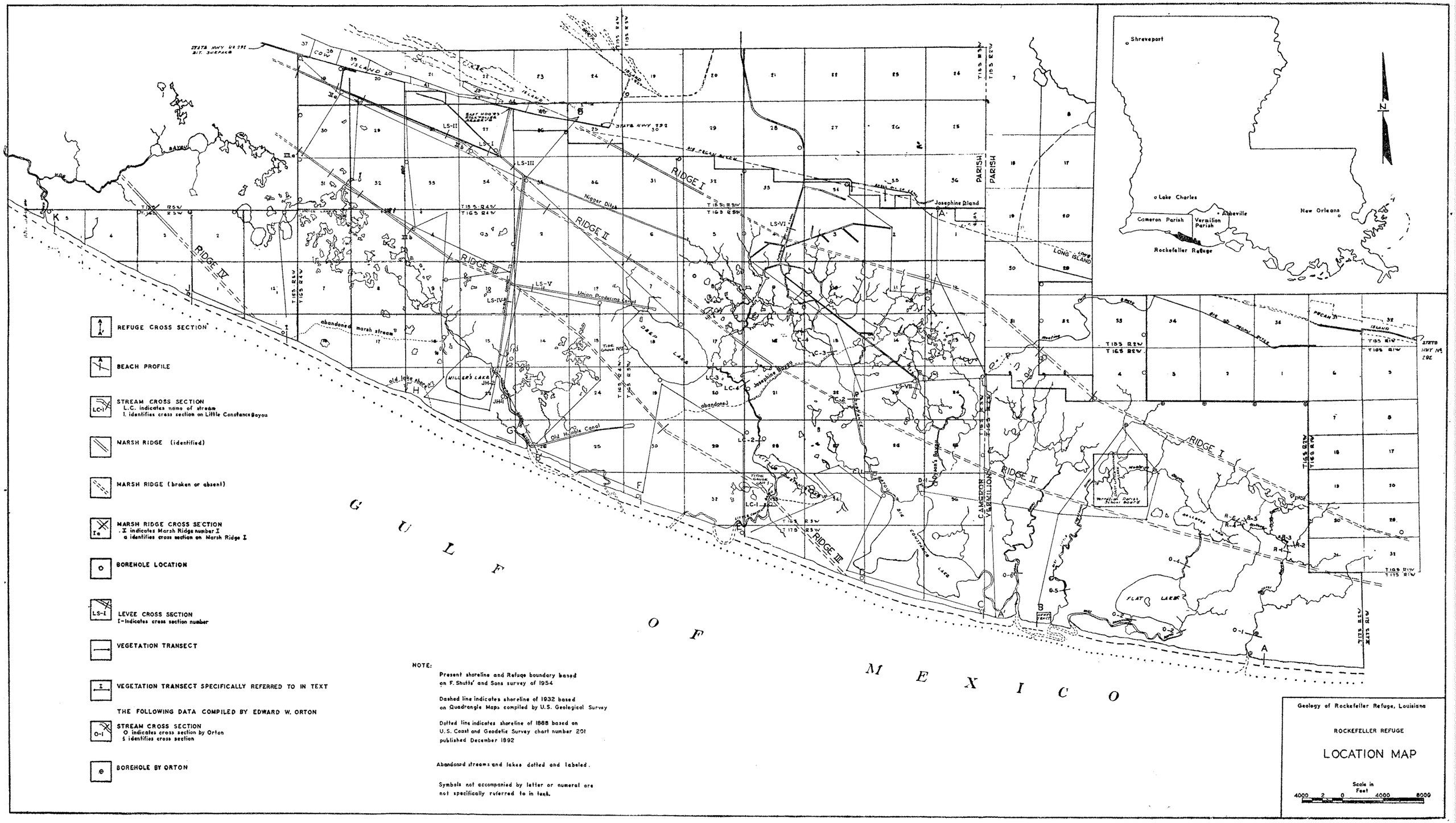
MARSH RIDGE, MARSH & LEVEE SEDIMENTS

Represented Graphically

GRADE SCALE IS BASED UPON

U.S. BUREAU OF SOILS CLASSIFICATION

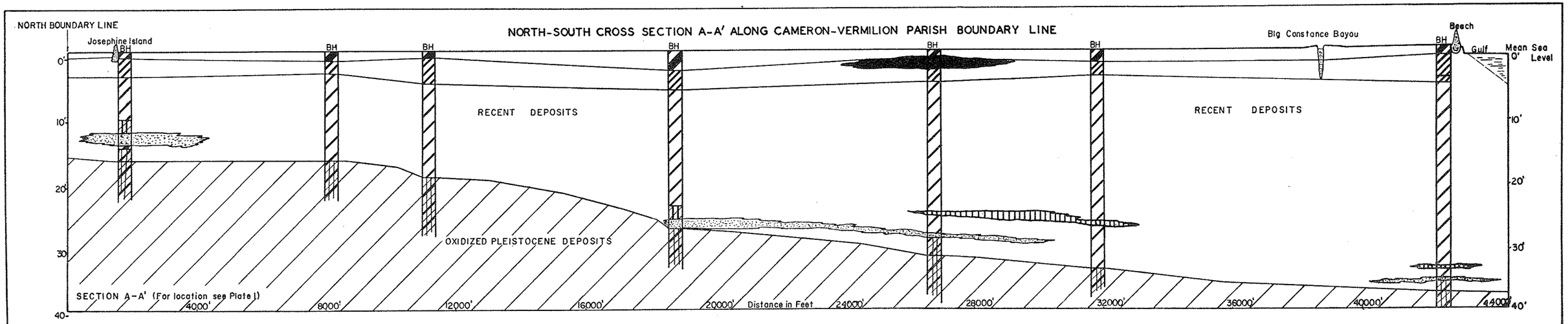
839-B

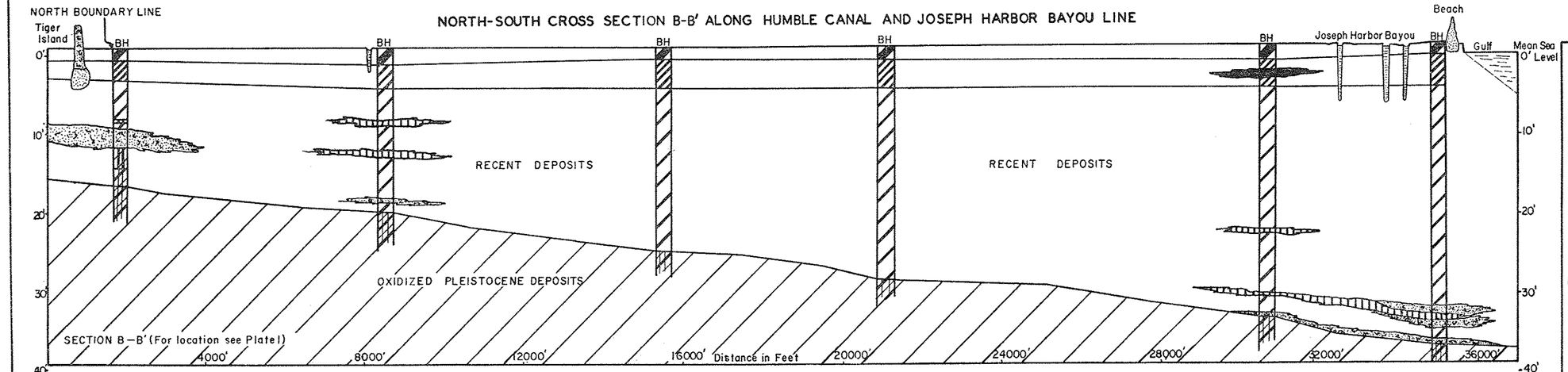


Shreveport
Lake Charles
Abbeville
New Orleans
Cameron Parish
Vermilion Parish
Rockefeller Refuge
RIDGE I
RIDGE II
RIDGE III
RIDGE IV
Nigger Ditch
Union Producing Canal
Josephine Island
LONG ISLAND
PARISH
CAMERON
VERMILION
abandoned marsh stream
old lake shore
Old Humble Canal
Josephine Bayou
MILLER'S LAKE
DEEP LAKE
FLAT LAKE
GULF OF MEXICO
REFUGE CROSS SECTION
BEACH PROFILE
STREAM CROSS SECTION
L.C. indicates name of stream
I. identifies cross section on Little Constance Bayou
MARSH RIDGE (identified)
MARSH RIDGE (broken or absent)
MARSH RIDGE CROSS SECTION
. I indicates Marsh Ridge number I
a identifies cross section on Marsh Ridge I
BOREHOLE LOCATION
LEVEE CROSS SECTION
I-Indicates cross section number
VEGETATION TRANSECT
VEGETATION TRANSECT SPECIFICALLY REFERRED TO IN TEXT
THE FOLLOWING DATA COMPILED BY EDWARD W. ORTON
STREAM CROSS SECTION
O indicates cross section by Orton
I identifies cross section
BOREHOLE BY ORTON
NOTE:
Present shoreline and Refuge boundary based on F. Shutts' and Sons survey of 1954
Dashed line indicates shoreline of 1932 based on Quadrangle Maps compiled by U.S. Geological Survey
Dotted line indicates shoreline of 1888 based on U.S. Coast and Geodetic Survey chart number 201 published December 1892
Abandoned streams and lakes dotted and labeled.
Symbols not accompanied by letter or numeral are not specifically referred to in text.
Geology of Rockefeller Refuge, Louisiana
ROCKEFELLER REFUGE
LOCATION MAP
Scale in Feet
4000 2 0 4000 8000

PLATE I

839-R





GEOLOGY OF ROCKEFELLER REFUGE, LOUISIANA

NORTH-SOUTH CROSS SECTIONS

SECTION A-A' CAMERON-VERMILION LINE

SECTION B-B' HUMBLE CANAL LINE

LEGEND

Horizontal Scale 1" = 2000' Vertical Scale 1" = 10'

Datum Plane is Mean Sea Level

RECENT DEPOSITS
- Marsh, Mudflat, Lake
  - highly organic clay
  - organic clay, gray black or oxidized
  - soft gray clay metallic luster
  - peat, may be black to brown
- Lake, Stream Nearshore
  - silt, gray to gray black
  - clayey silt
  - silty clay
- Baybottom, Beach, Stream
  - fine sand with tiny shell fragments
  - fine sand with whole shells

PLEISTOCENE DEPOSITS (Undifferentiated)
- oxidized gray silty clay

PLATE XI