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THE MOREAU-CAMINADA CHENIER COMPLEX, SOUTHEASTERN LOUISIAN

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ABSTRACT

The Moreau-Caminada chenier complex south of New Orleans is the only subrecent chenier system on the surface in Louisiana east of the classic west Louisiana cheniers. It occupies an area 16 km long and up to five km wide east of the mouth of Bayou Lafourche. About sixty ridges, 50-120 m wide and 7.5 km at the longest, form the complex; the highest ridge elevation is only 1.2 m. Large new exposures along Louisiana Highway 1 revealed that the sand, which at places is at least ten meters thick, is very fine grained and very well sorted. Detrital lignite grains make up as much as 7.6 percent of this chenier sand. Shell fragments, abundant in the western Louisiana cheniers, are absent. Authochthonous and detrital peat layers and laminae 1 mm or more thick are interlayered with the sand. Dating of three autochthonous peat samples from the Louisiana Construction Company and Plaisance Dragline and Dredging Company sand borrow pits revealed 2940± 120 to 2340± 120 ys. B. P. ages. Thus the cheniers are much older than the surrounding Lafourche-and Lafourche-Terrebonne subdelta sediments. After the last Lafourche distributary stream lost its water supply, substantial erosion started the destruction of the chenier complex. A coastal strip up to 2 km wide was eroded between 1890 and 1934, due to the closing off of the Bayou Lafourche discharge.

New information about the Mississippi deltaic plain stratigraphy refutes suggestions that the southwest Louisiana chenier ridges formed during periods when the active delta lobes were on the other end of the Deltaic Plain. Seven sets of chenier ridges formed in the southwest Louisiana chenier plain between 2800 and 600 B. P. (Gould-McFarlan, 1959) while not only the distant St. Bernard distributaries were active but also the much closer Lafourche distributaries (Frazier, 1967). The Moreau-Caminada cheniers were forming also in the proximity of one of the active Lafourche subdeltas. Cyclicity in chenier progradation should be attributed to fluctuations in *local* sediment supply and hydraulic conditions. Enough sediment must have been present in the littoral drift to prevent the wholesale erosion of the shore and allow the construction of ridges. Low ridge elevations in the Moreau-Caminada area are attributed to the great thickness of underlying post-Pleistocene sediments in contrast to the shallow Pleistocene surface in southwestern Louisiana.

Shore recession in the chenier plain was accompanied by the reversal of littoral drift directions. The Moreau-Caminada cheniers indicate drift toward the west while the presently prevailing drift direction in the area is toward the east. The present drift direction may date back to the construction of the Plaquemines subdelta which since about 800 B. P. reduced the strength of the currents and waves from the east.

Chenier ridge configurations depend primarily on the original outline of the shoreline and upon the conditions of sediment supply from the sea, deltas, or from the estuaries. Different ridge patterns develop if the dominant littoral drift approach direction is similar or identical with that of the main sediment source area. In the present case a substantial portion of the ridge sands came by the drift from the east, northeast, while most of the sediment came probably from the west, the area of an active Mississippi subdelta. A similar situation exists on the western bank of the Sabine Pass, eastern Texas, where the ridges developed from the southwest and most of the sediment supply came from the east with the prevailing drift and from the direction of Sabine Lake on the north.

DISTRIBUTION OF SILICATE MINERALS IN FLORIDA BAY

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ABSTRACT

The dominantly carbonate sediments within Florida Bay contain small percentages of insoluble silicate minerals, ranging in our samples from 1.25 to 14.91 percent by weight. Quartz, chlorite, and montmorillonite compose most of the silicate fraction, with very minor amounts of illite and kaolinite. Clay mineral distribution can be described by concentration gradients based on two end member assemblages: A chloritic assemblage dominates in the eastern part of the bay, but declines westward. In a reciprocal manner, a montmorillonitic assemblage dominates the western bay and declines eastward. The two clay mineral assemblages reflect different sources—chlorite from the Atlantic province, and montmorillonite from the Gulf of Mexico province. Shallow and subaerial carbonate mud banks and intervening basins inhibit mixing of waters bearing the two clay assemblages; this has caused the relatively rapid transition from one clay suite to another in the 30-40 mile span of Florida Bay. The clay mineral fractions of *similar* ancient carbonate reef trends would be expected to show analogous concentration gradients in the back-reef area.