

# Barremian-Albian Larger Benthic Foraminiferal Zones (Lower Cretaceous), Gulf of Mexico Region: A Key to Correlating Carbonate Reservoirs

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## Abstract

For about 30 m.y. from about 130 to 100 Ma during the Early Cretaceous Barremian to Albian ages, the proto-Gulf of Mexico was partly encircled by a giant carbonate shelf from Florida to Texas and south into northern Mexico and by isolated carbonate platforms in eastern Mexico, the Yucatan Peninsula/Platform and Central America. These strata have been important hydrocarbon reservoirs associated with source rocks. In addition, these southern North and Central American carbonate strata archive important oceanic signals such as carbon chemozones, oceanic anoxic events and sea-level changes.

The Early Cretaceous Caribbean Biotic Province was composed of many of the same marine species as in the Mediterranean and Asian provinces as well as endemic species. Biostratigraphic zonation of the Barremian, Aptian, and Albian stages in the Gulf region has evolved since 1956 and is now more precisely defined by first appearance and last appearance datums (FAD/LAD) of calcareous nannofossils, nannoconids, colomiellids, and planktic foraminifers in numerous outcrop and drill hole sections. Rudist bivalve zones are recognized in cores and outcrops. However, larger benthic foraminiferal zones have not been updated until now. Stratigraphic correlation of these complex carbonates and associated rocks establishes the context of reservoir facies and their chronostratigraphic relations globally. The principal goal of this contribution is to present a practical biostratigraphy of the larger benthic foraminifers.

Six Barremian to Albian benthic foraminiferal biozones are here defined by the first occurrences or overlapping ranges in the Gulf of Mexico region of the United States, Mexico, and Central America. These zones are in ascending order: (1) *Choffatella decipiens* Interval Range Zone (IRZ), Barremian from FAD of *Choffatella decipiens* to FAD of *Palorbitolina lenticularis*; (2) *Palorbitolina lenticularis* Total Range Zone (TRZ), lower Aptian; (3) *Paracoskinolina sunnilandensis* IRZ, lower to upper Aptian from LAD of *Palorbitolina lenticularis* to FAD *Mesorbitolina texana*; (4) *Mesorbitolina texana* IRZ, uppermost Aptian to lower Albian from FAD *Mesorbitolina texana* to FAD of *Carseyella walnutensis*; (5) *Carseyella walnutensis* IRZ, middle to lower upper Albian, from FAD to FAD of *Paracoskinolina coogani*; and (6) *Paracoskinolina coogani* TRZ, uppermost Albian.

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