United States Department of Interior
Bureau of Ocean Energy Management
Biostratigraphic Chart of the Gulf of Mexico Offshore Region, Jurassic to Quaternary

BOEM
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Recent through Oligocene

Time (mya) (not to scale)	CHRONOSTRATIGRAPHY System	Subsystem	Series	Stage	BIOSTRATIGRAPHY Foraminiferal planktic & benthic regional and local markers	Calcareous nannoplanktic regional and local markers	BOEM CHRONOZONE
	Quaternary		Holocene		Globorotalia inflata		
0.20			Pleistocene	Ionian: Upper	Globorotalia flexuosa Sangamon fauna	Emiliania huxleyi (base of acme) Pontosphaera indooceanica Gephyrocapsa oceanica flood Gephyrocapsa caribbeanica flood	PLU
0.78				Ionian: Middle	Globorotalia truncatulinoides coiling change, right-to-left Trimosina "A"	Helicosphaera inversa Pseudoemiliania lacunosa "A" Pseudoemiliania lacunosa "B" Gephyrocapsa caribbeanica increase Gephyrocapsa omega Gephyrocapsa parallela Pseudoemiliania ovata	PLM
1.77				Ionian: Lower; Calabrian	Stilostomella antillea Globorotalia incisa Sphaeroidinella dehiscens acme "A" Trimosina "A" acme Angulogerina magna Hyalinea balthica / Trimosina "B" Globorotalia tosaensis tosaensis Sphaeroidinella dehiscens acme "B" Angulogerina "B" Uvigerina hispida	Pseudoemiliania lacunosa "C" acme Gephyrocapsa aperta acme Scyphosphaera pulcherima, Gephyrocapsa caribbeanica (large) Helicosphaera sellii Lithostromation perdurum Calcidiscus macintyrei	PLL
2.60	Tertiary	Neogene	Pliocene	Gelasian: Upper	Globorotalia crassula acme, Globorotalia praehirsuta Cristellaria "S" Globorotalia menardii coiling change, left-to-right Globorotalia exilis Globorotalia miocenica Globorotalia pertenuis Bolivina imporcata / "P" Lenticulina 1 Textularia crassisepta / "P"	Discoaster brouweri, Calcidiscus macintyrei increase Discoaster brouweri "A" Discoaster pentaradiatus Discoaster surculus	PU
3.58				Piacenzian: Upper	Ceratobulimina pacifica Cassidulina laevigata carinata acme / "L" Haplophragmoides emaciatum Saracenaria "H" Globorotalia multicamerata Globoquadrina altispira = Valvulineria "H" Cyclammina sp. Arenaceous fauna Cibicides grosseperforatus Sphaeroidinellopsis seminulina Textularia 1	Discoaster asymmetricus Cycloperfolithus carlae, Discoaster tamalis	
5.32				Piacenzian: Lower; Zanclian	Buccella (Eponides) hannai acme Cibicides marsi Globorotalia margaritae Uvigerina rustica Globigerina druryi / nepenthes "B" Globigerina nepenthes Buliminella 1 Siphotextularia jugosa / "J" Sigmoilina "P" / cf. schlumbergeri Sphaeroidinellopsis multilobata Globigerinoides mitra Globorotalia plesiotumida acme	Sphenolithus abies Reticulofenestra pseudoumbilica, Discoaster intercalcaris, Dictyococcites antarcticus Pseudosphenolithus abies "B" acme Sphenolithus abies "B" Amaurolithus tricorniculatus Ceratolithus acutus Discoaster quintatus	PL
7.12			Miocene	Messinian: Upper	Globorotalia menardii coiling change, right-to-left Globorotalia margaritae primitiva Globorotalia juanai Textularia "X" Textularia tatumi Bolivina denticulata	Discoaster quinqueramus Discoaster berggrenii Reticulofenestra rotaria Discoaster berggrenii "A"	MUU
11.20				Tortonian: Upper	Textularia 6 Bigenerina irregularis / 6 Globorotalia acostaensis coiling change, right-to-left Planulina renzi Reophax davepopei, Robulus "E" Bigenerina floridana / "A" Cristellaria "K" Melonis pompilioides increase Cibicides trincherasensis Uvigerina carapitana Amphistegina "E" Cyclammina 3 Globorotalia lenguaensis, Bolivina thalmanni Discorbis 12 Bigenerina "B" Eponides mansfieldi Textularia "G" Globoquadrina dehiscens Robulus 15 Textularia "L" Cibicides inflata Cibicides carstensi, Bigenerina 2 Globorotalia mayeri Globorotalia siakensis Uvigerina 3, Cibicides carstensi increase	Discoaster neohamatus Discoaster loeblichii Minylithus convallis Catinaster mexicanus Discoaster bellus, Discoaster calcaris Discoaster prepentaradiatus Discoaster prepentaradiatus increase Discoaster bollii, Catinaster calyculus Discoaster hamatus Catinaster coalitus Discoaster exilis Helicosphaera walbersdorfensis Coccolithus miopelagicus	MLU
14.80				Serravallian: Middle	Globorotalia fohsi robusta Robulus 5 / 55 Textularia "W" Globorotalia fohsi lobata Globorotalia fohsi praefohsi Globorotalia fohsi fohsi Globorotalia peripheroacuta Bigenerina humblei Gyroidina miocenica Globorotalia peripheroronda Cristellaria "I" Praeorbulina glomerosa Cibicides opima	Discoaster kugleri Discoaster kugleri acme Calcidiscus premacintyrei Cyclicargolithus floridanus Discoaster sanmiguelensis Sphenolithus heteromorphus Discoaster adamsiformis Sphenolithus heteromorphus acme	MUM MMM
16.40				Langhian	Robulus 53 Amphistegina "B" Globorotalia siakensis coiling change, left-to-right Globigerinatella insueta Robulus "L" / 43 Cibicides 38	Helicosphaera ampliaperta Discoaster deflandrei acme Discoaster calculosus	MLM
20.52				Burdigalian: Lower	Camerina 1, Robulus 54B = Cristellaria 54 Saracenaria sp. / "D" Gyroidina "K" / 9 / 4 Catapsydrax stainforthi Catapsydrax dissimilis, Robulus chambersi, Discorbis bolivarensis / "B", Cristellaria "A" Marginulina ascensionensis / "A" Globigerina binaensis Gyroidina 8 Siphogenerina fredsmithi	Sphenolithus belemnos Reticulofenestra gartneri Sphenolithus disbelemnos Orthorhabdus serratus Triquetrorhabdulus carinatus, Triquetrorhabdulus challengeri Discoaster calculosus increase	MUL MML
23.80				Aquitanian	Siphonina davisi Planulina palmerae Globigerinoides primordius Lenticulina hanseni Lenticulina jeffersonensis, Cristellaria "R", Globorotalia kugleri, Globigerina anguilsuturalis	Discoaster saundersi Sphenolithus dissimilis Cyclicargolithus abisectus Helicosphaera recta	MLL
28.50		Paleogene	Oligocene	Chattian: Upper	Robulus "A" Discorbis gravelli Globigerina ciperoensis ciperoensis Heterostegina texana Cibicides jeffersonensis Bolivina perca Marginulina idiomorpha Marginulina vaginata Marginulina howei Camerina "A" Miogypsinoides "A" Cibicides hazzardi Globorotalia opima nana Globorotalia opima opima Cristellaria "H" Marginulina texana Bolivina mexicana	Dictyococcites bisectus Sphenolithus delphix, Ericsonia fenestrata Zygrhablithus bijugatus Sphenolithus ciperoensis Sphenolithus distentus	OU
33.70				Rupelian: Lower	Nonion struma Nodosaria blanpiedi Discorbis "D" Chiloguembelina cubensis Textularia mississippiensis seligi Anomalina bilateralis Globigerina ampliapertura Spiroplectammina mississippiensis Globorotalia increbescens Textularia warreni Pseudohastigerina micra Loxostoma "B" Cibicides pippeni Cibicides mississippiensis	Sphenolithus predistentus Helicosphaera compacta Sphenolithus pseudoradians, Reticulofenestra hampdenensis Reticulofenestra umbilica Reticulofenestra hillae Ericsonia formosa Ericsonia subdisticha Discoaster nodifer Ismolithus recurvus	OL

Eocene through Jurassic

Time (mya) (not to scale)	CHRONOSTRATIGRAPHY System	Subsystem	Series	Stage	BIOSTRATIGRAPHY Planktic & benthic foraminifera & ostracod (O) regional and local markers	Calcareous nannoplanktic regional and local markers	BOEM CHRONOZONE
33.70	Tertiary	Paleogene	Eocene: Upper	Priabonian	Globorotalia cerroazulensis cocoaensis, Hantkenina alabamensis Textularia hockleyensis Globorotalia cerroazulensis pomeroli Textularia dibollensis Globigerinatheka tropicalis / mexicana Globigerinatheka semiinvoluta Camerina moodybranchensis, Camerina jacksonensis	Discoaster saipanensis, Micrantholithus altus Discoaster barbadiensis Chiasmolithus consuetus Cribrocentrum reticulatum Sphenolithus obtusus	EU
37.00			Eocene: Middle	Bartonian	Nonionella cockfieldensis Truncorotaloides rohri Discorbis yeguaensis Eponides yeguaensis Nodosaria mexicana Ceratobulimina eximia Morozovella lehneri Eponides guayabalensis Globorotalia bullbrooki Truncorotaloides topilensis Clavulinoides guayabalensis Operculinoides sabinensis Orbulinoides beckmanni Subbotina frontosa Acarinina broedermanni	Micrantholithus procerus, Chiasmolithus grandis, Pemma papillatum Pemma basquensis Pemma stradneri Pemma balium Sphenolithus radians Chiasmolithus solitus Chiasmolithus gigas	EM
41.30				Lutetian	Cyclammina caneriverensis Discocyclina advena Morozovella aragonensis Haplocythendea stenzelli (O)	Discoaster sublodoensis, Sphenolithus spiniger Rhabdosphaera inflata Discoaster lodoensis	
49.00				Ypresian	Acarinina soldadoensis Morozovella quetra Acarinina angulosa Morozovella rex / subbotinae Morozovella formosa formosa Globorotalia wilcoxensis Morozovella acuta	Chiasmolithus californicus Tribrachiatus orthostylus Toweius crassus Tribrachiatus contortus Discoaster multiradiatus	EL
54.50			Paleocene: Upper	Thanetian	Morozovella velascoensis Cytheridea sabinensis (O) Discorbis washburni Planulorotalites pseudomenardii Morozovella angulata Planulorotalites pusilla pusilla Planulorotalites compressa Vaginulina longiforma, Subbotina pseudobulloides Morozovella uncinata	Fasciculithus tympaniformis Heliolithus kleinpellii Heliolithus reidelii Toweius eminens Chiasmolithus bidens Discoaster diastypus	LU
57.90				Selandian	Vaginulina midwayana, Globorotalia inconstans		
60.90			Paleocene: Lower	Danian	Globorotalia trinidadensis Globoconusa daubjergensis Robulus pseudocostata Globigerina eugubina	Cruciplacolithus edwardsii Markalius inversus astroporus	LL
65.00	Cretaceous		Upper	Maastrichtian	Abathomphalus mayaroensis Globotruncana contusa Gansserina gansseri Rosita fornicata Globotruncana ventricosa Globotruncana lapparenti	Micula decussata Micula prinsii FAD Micula murus FAD Watznaueria barnesae FAD Nephrolithus frequens FAD Reinhardites levis Tetralithus trifidus Tranolithus phacelosus Aspidolithus parcus constrictus	KUU
71.30				Campanian	Globotruncana calcarata Globorotalites micheliniana Globotruncana elevata Archaeoglobigerina bosquensis Stensioina exsculpta exsculpta Marginotruncana marginata Marginotruncana coronata Whiteinella baltica Planoglobulina taylorana	Reinhardites anthophorus "A" Eiffellithus eximius Aspidolithus parcus parcus Reinhardites anthophorus "B" Lithastrinus grilliii Bukryaster hayi Broinsonia enormis Marthasterites furcatus	
83.50				Santonian	Dicarinella asymetrica Whiteinella inornata Marginotruncana sinuosa Hedbergella delrioensis Stensioina granulata granulata Dicarinella concavata, Marginotruncana renzi	Eprolithus floralis Zeugrhabdotus noeliae Lithastrinus moratus	
85.80				Coniacian	Dicarinella imbricata Whiteinella paradubia Hedbergella amabilis	Quadrum gartneri Stoverius achylosus	
89.00				Turonian	Dicarinella hagni Planulina eaglefordensis Helvetoglobotruncana helvetica Praeglobotruncana stephani, Helvetoglobotruncana praehelvetica	Chiastozygus platyrhethum Parhabdolithus achlyostaurion Calculites axosuturalis Parhabdolithus asper	KLU
93.50				Cenomanian	Globigerinelloides bentonensis Rotalipora cushmani Rotalipora greenhornensis Rotalipora appenninica Rotalipora reicheli Lenticulina gaultina, Fossocytheridea lenoirensis (O), Favusella washitensis Textularia rioensis Rotalipora gandolfii	Microstaurus chiastius Axopodorhabdus albianus Lithraphidites acutus Lithraphidites pseudoquatratus Coriollithon kennedyi	
98.90			Lower	Albian	Planomalina buxtorfi Rotalipora ticinensis Ticinella roberti Cytherei fredericksburgensis (O), Cyth. brevis (O) Cytheridea goodlandensis (O), C. oliverensis (O) Biticinella breggiensis Ammobaculites goodlandensis Dictyoconus walnutensis Eocytheropteron trinitiensis (O) Orbitolina texana Rehacytheresis ? aff. R. glabrella (O)	Hayesites albiensis Braarudosphaera africana Braarudosphaera hockwoldensis Prediscosphaera columnata Crucicribrum anglicum Rucinolithus irregularis	KUL KML
112.20				Aptian	Ticinella bejaouaensis Planomalina cheniourensis Epistomina sp. Globigerinelloides algerianus Globigerinelloides blowi Schackoina cabri Globuligerina hoteriva Hedbergella sigali Choffatella decipiens	Eprolithus antiquus Conusphaera mexicana, Micrantholithus obtusus Nannoconus kamptneri Micrantholithus hoschulzii Nannoconus steinmanni Conusphaera rothii	KLL
121.00				Barremian	Schuleridea lacustris (O) Clavihedbergella eocretacea	Nannoconus colomii Nannoconus abundans Calcicalathina oblongata Lithraphidites bollii	
127.00			Coahuilian	Hauter.		Speetonia colligata Crucellipsis cuvillieri	
132.00				Valang.	Everticyclammina virginulina Schuleridea acuminata (O)	Tubodiscus verenae Rucinolithus wisei Diadorhombus rectus Micrantholithus speetonensis	
137.00				Berriasian	Hutsonia vulgaris / callahani (O) Pentaschuleridea pentagonalis (O)	Polycostella senaria Polycostella beckmanni	
144.20	Jurassic		Upper	Tithonian	Gallaecytheridea postrotunda (O) Buccicrenata italica increase Eoguttulina amygdalina, Epistomina uhligi Epistomina stellacostata	Hexalithus noelae	JU
150.70				Kimmer.	Epistomina mosquensis Alveosepta jaccardi	Stephanolithion bigotii bigotii Stephanolithion bigotii maximum	
154.10				Oxfordian	Globuligerina oxfordiana Lenticulina quenstedti Paalzowella feifeli	Discorhabdus jungii Stephanolithion speciosum	
159.40			Middle	Callovian	Reinholdella crebra Epistomina regularis Epistomina coronata	Stephanolithion hexum Watznaueria crucicentralis	JM
164.40							

BOEM Gulf of Mexico Resource Evaluation
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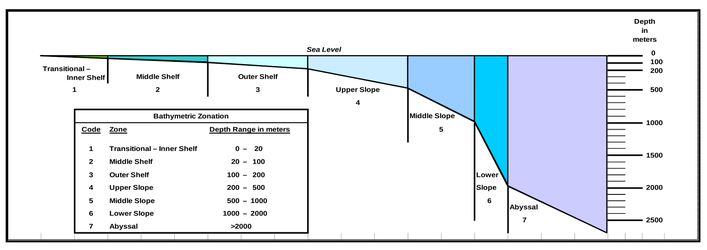
For public release May 1, 2003



Bathymetric Zonation		
Code	Zone	Depth Range in meters
1	Transitional – Inner Shelf	0 – 20
2	Middle Shelf	20 – 100
3	Outer Shelf	100 – 200
4	Upper Slope	200 – 500
5	Middle Slope	500 – 1000
6	Lower Slope	1000 – 2000
7	Abyssal	>2000

LEGEND

All foraminiferal markers are extinction points (LADs) unless otherwise indicated.
(O) indicates an ostracode species.
The calcareous nannoplanktic markers are mainly coccolith species LADs. Dinoflagellates and palynomorphs (pollen) are occasionally used.
LAD: **L**ast **A**ppearance **D**atum
FAD: **F**irst **A**ppearance **D**atum
Species LADs separated by a virgule (the diagonal mark "/") indicates either synonymous species or synchronous species.
Species LADs separated by "=" indicates synchronous species.
Two or more species LADs separated by a comma indicate synchronous species LADs.
(for example, Discoaster bollii, Catinaster calyculus are two separate but time-equivalent coccolith extinction points).
BOEM Chronozone: A body of rock formed during the same time span, bounded by biostratigraphic or correlative seismic markers.

References to this chart should be as follows:
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