COMPARATIVE BASIN STRATIGRAPHY CONGO

KWANZA - NAMIBE

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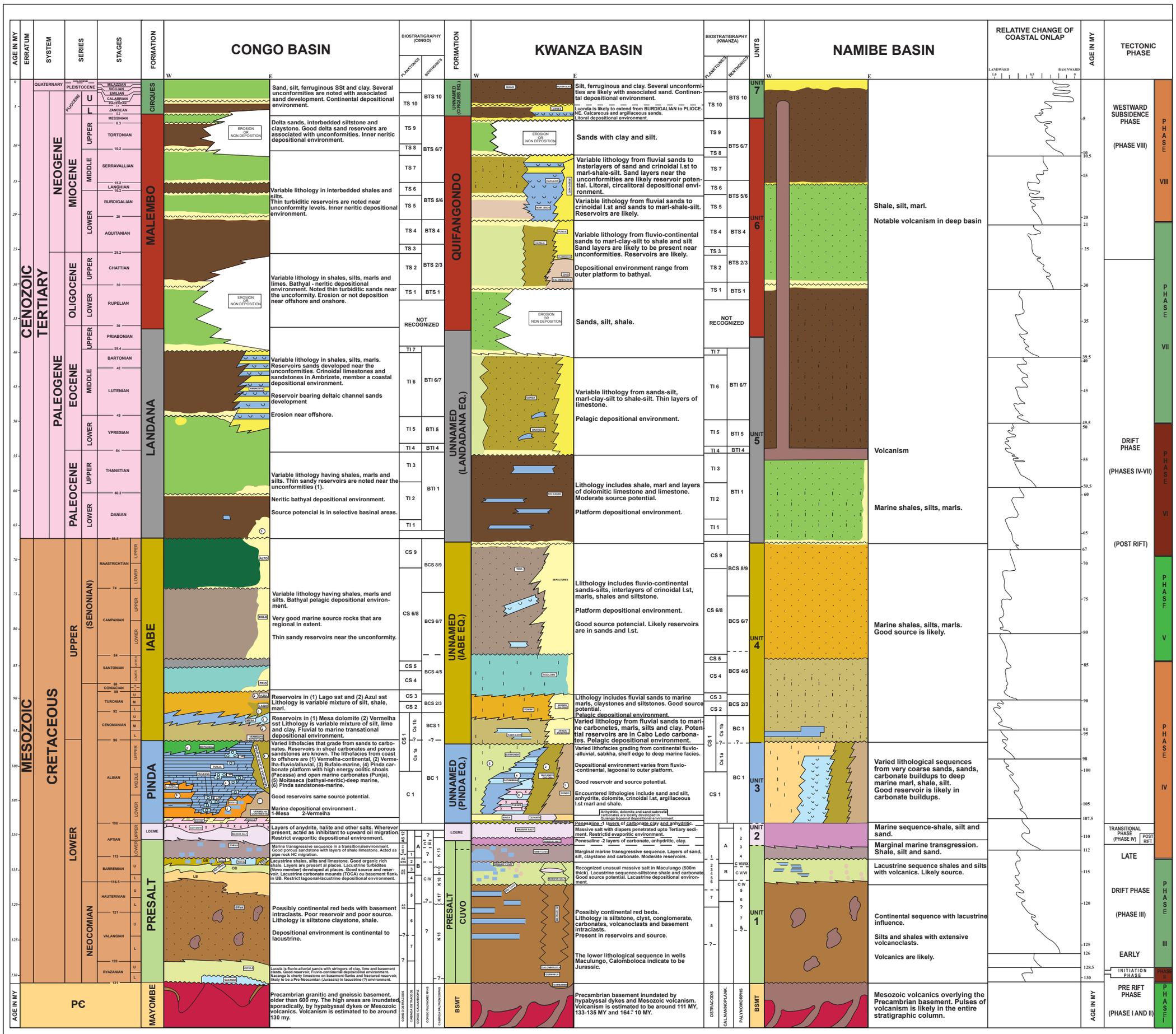
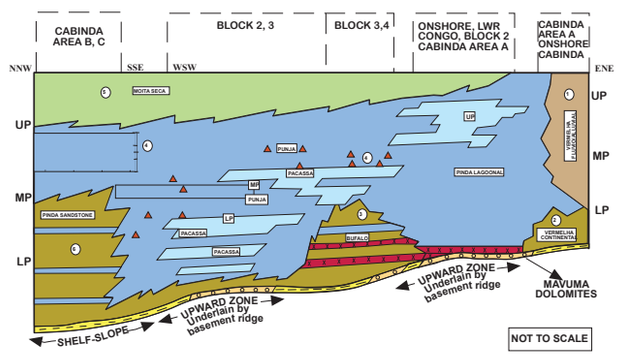
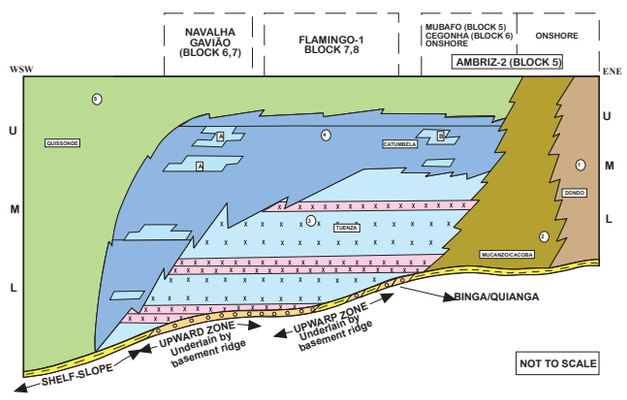
AGÊNCIA NACIONAL DE PETRÓLEO, GÁS E BIOCOMBUSTÍVEIS

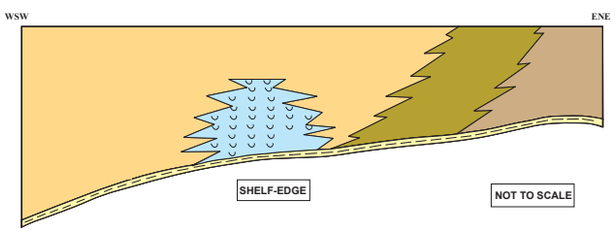




Schematic view of Albian Platfotm in Congo Basin. Varied lithologies are noted across the basin from onshore to present day shelf-slope. Prominent oolitic carbonate reservoirs in Upper, Middle and Lower Albian are associated with upward zones (or paleo shelf-edge). Chert market beds are noted in Middle Pinda.



Schematic view of Albian Platfotm in Kwanza Basin. Reservoir s (A,B) are in Upper, Middle (Catumbela) and Lower (Tuenza) Albian Carbonates, associated with upwarp zones (or paleo shelf-edge).



Schematic view of Albian Platfotm in Namibe Basin. Shelf-edge carbonate buildups are anticipated. No exploration well in the basin.

Schematic Albian platform showing varied lithofacies in Congo, Kwanza and Namibe

Biostratigraphy: explanation

1. Presalt: Congo Basin

Cabinda Ostracods by Chevron: 1. Hourcquia africana, 2. Petrobrasia spp.
3. Cypridea (Sebastianities), 4. Reconcavona,
5. Paracypridea, 6. Tucanocypris, 7. Metacypris.

Lower Congo Ostracods: Zonation by Grosdidier, E.

Lower Congo Calcareous Nannoplankton: Zonation by Sissingh, 1977.

A) C. litterarius B) M. obtusus

Cabinda Palynomorphs: Zonation by Chevron

Congo Palynomorphs: Zonation by Drapeau, 1984.

Kwanza Basin

Ostracods: 1. Cypridea spp. 2. Hourcquia africana
3. Cypridea aff. salvadorensis, 4. Petrobrasia tenuistriatra
5. Cypridea spp. 6. Candona cf. gregaria, 7. Reconcavona ? polita,
8. Paracypridea brasiliersis

Calcareous nannoplankton: similar to Congo

Palynomorphs: Zonation by A Doerenkamp.
1. Gnetaceapollenites 2. Cicatricosisporites diversus
3. Monosulcites, 4. Araucariacites, 5. Classopolis classoides,
6. Dicheiropolis etruscus, 7. Clavatipollenites hughuesii,
8. Concavissimisporites cf. variverrucatus

Biostratigraphy: explanation

2. Albian - Cenomanian (zonation based on Gofas, 1985)

Albian: Planktonic Foraminifer: Favusella washitensis;
Benthonic Foraminifer: Trocholina silvai; Veenia spp. (Ostracods); Nannoconus donatensis (Calcareous Nannoplankton);
Anomalina berthelini (Benthonlc Foraminifer)

Cenomanian: Dominated by Planktonics.
Common Occurence is Hedbergellids and Rotaliporids.

3. Turonian to Maastrichtian (zonation based on Gofas, 1985)

Planktonic Zone CS 9-Rugoglobigerina; CS 6/8 - Contusotruncana fornicata;

CS 5 - Dicarinela carinata; CS 4 - Praeglobotruncana inornata;

CS 3 - Archaeoglobigerina; CS 2 - Whiteinella spp.

Benthonics: BCS 8/9 - Orthokarstenia clavata;

BCS 6/7 - Orthokarstenia dentata/Gabonita elongata;

BCS 4/5 - Stensioeina spp;

BCS 2/3 - Gabonita obesa/Dorothia oxycona

Biostratigraphy: explanation

4. Paleocene - Eocene (zonation based on Gofas, 1985).

Planktonic: TI 1- Globorotalia trinidadensis/Globigerina daubjergensis; TI 2 - Morozovella angulata; TI3 - Globorotalia velascoensis; TI 4 - Globorotalia aequa/lensiformis

Benthonic: BTI - 1/3 - Bolivina africana Eponides pseudoetevatus BTI 4 - Lexostomoides/Nuttalides; BTI 5 - Uvigerina spp. BTI - Eponides elevatus.

Biostratigraphy: Explanation

5 - Oligocene - Miocene _Pliocene

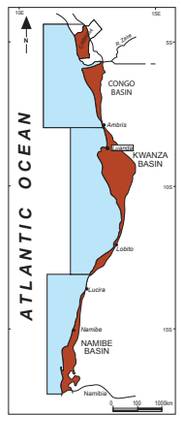
Planktonics (zonation based on Meijer, 1972)
TSI - Globigerina ampliapertura; TS 2 - Globigerina angulisuturalis; TS 3 - Globigerinoides primordius;
TS 4 - Globigerinita; TS 5 - Globigerinatella insueta;
TS 6 - Globorotalia fohsi s.l.; TS 7 - Globorotalia siakensis;
TS 8 - Globorotalia menardii; TS 9 - Globorotalia acostaensis; TS 10 - Globorotalia margaritae.

Benthonics (zonation based on Gofas, 1985)
BTS 1 - Uvigerina alazanesis;
BTS 2/3 - Gavelinella stenzelli/Uvegerina mantaensis;
BTS 4 - Gavelinella beninensis; BTS 5/6 - Eponides eshira/ /Bolivina interjuncta;
BTS 6/7 - Marginulina costata;
BTS 10 - Rectuvigerina siphogenerinoides.

EXPLANATION OF TECTONIC PHASE:

PHASE-I	: LANDSCAPE OF EXTREME PENEPLANATION
PHASE-II	: DOMING AND FLOOD BASALT ERUPTION DEPOSITED FLUVIO-ALLUVIAL SEDIMENT.
PHASE-III	: RIFTING AND CONTINENTAL EXTENSION. DEPOSITED CONTINENTAL AND LACUSTRINE SEDIMENT.
PHASE-IV	: THERMAL SUBSIDENCE, EVAPORITE FORMATION DEPOSITED MARINE DOMINETED SEDIMENT, SEA-LEVEL RISE.
PHASE-V	: ACCELERATED PLATE SEPARATION AND FURTHER SEA -LEVEL RISE.
PHASE-VI	: DROP IN RATE OF PLATE SEPARATION, FALL IN SEA-LEVEL.
PHASE-VII	: SUBSTANTIAL FALL IN SEA-LEVEL, NON DEPOSITION ON THE MARGIN. WESTWARD TILT AND STRONG UPLIFT.
PHASE-VIII	: RISE FOLLOWED BY FALL IN SEA-LEVEL LEAD TO TRANSGRESSION AND REGRESSION. SECOND TIME, WESTWARD TILT AND MARGIN UPLIFT.

For elaboration of tectonic phase, Refer "Avaliação de Formações de Angola", SCHLUMBERGER, 1991



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ANPG		BASIN STRATIGRAPHY

REFERENCES:

1. Chronostratigraphic scale is from "Chronoly of Flutuating Sea Levels Since The Triassic" U. Bilal, Hardenbol and Peter R. Vail, 1987, Science.
2. Lithostratigraphic Columns - Stratigraphic Commission For Angola Sedimentary Basins, 1985.
3. Biostratigraphy: Mario G.P. Brandao, Laboratorio de Exploracao e Producao (Sonangol).