GI 261 Cyclostratigraphy and Astrochronology

Examples of cyclostratigraphy given in Strasser et al., 2006

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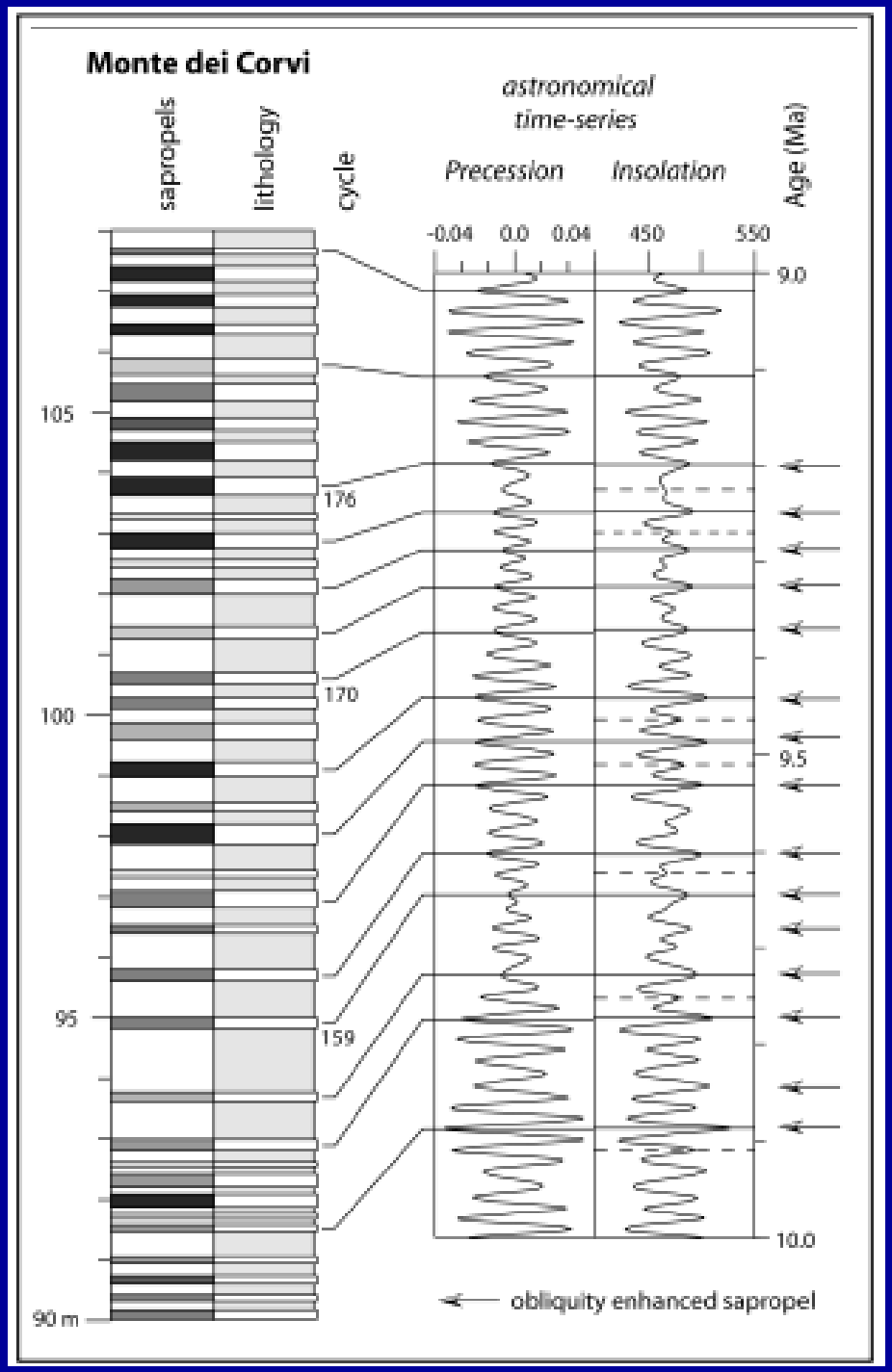
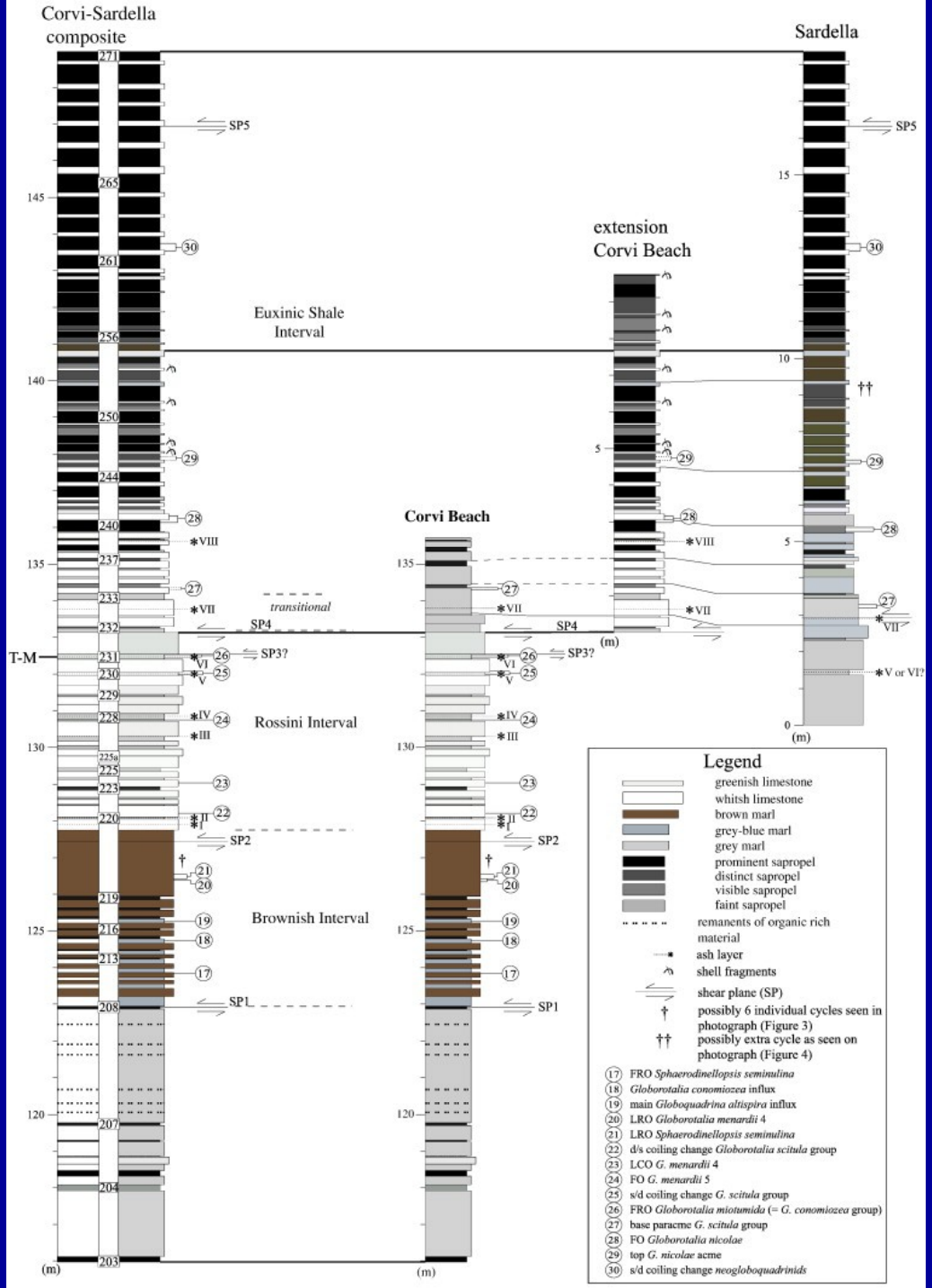
http://sgi.isprambiente.it/gssp/Corvi.aspx



Strasser et al., 2006



Husing et al., 2009

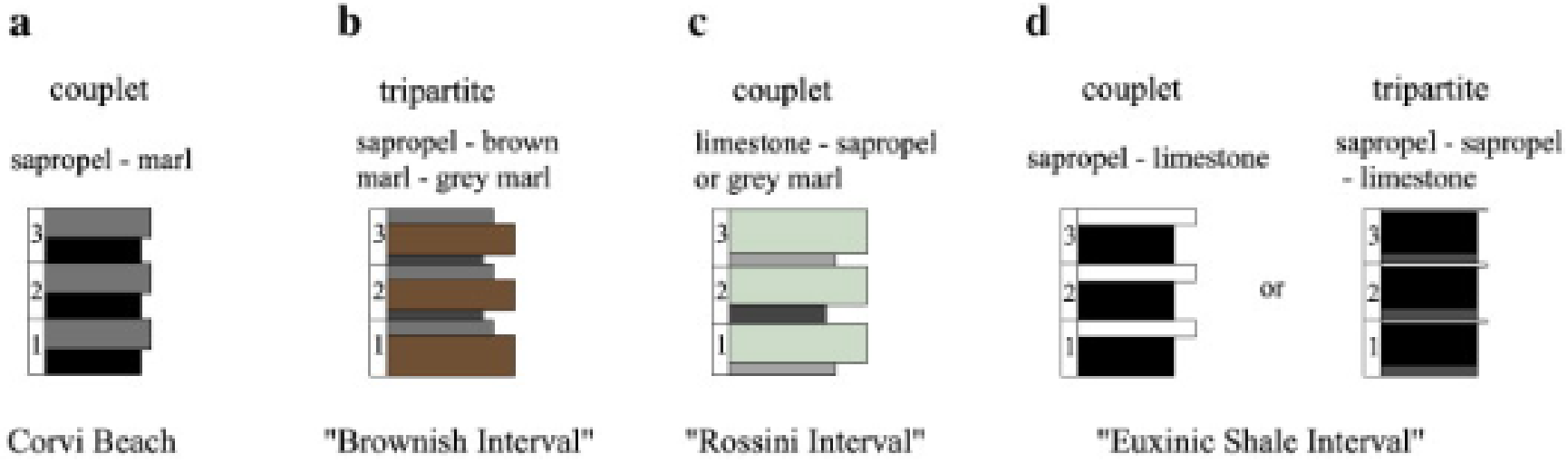


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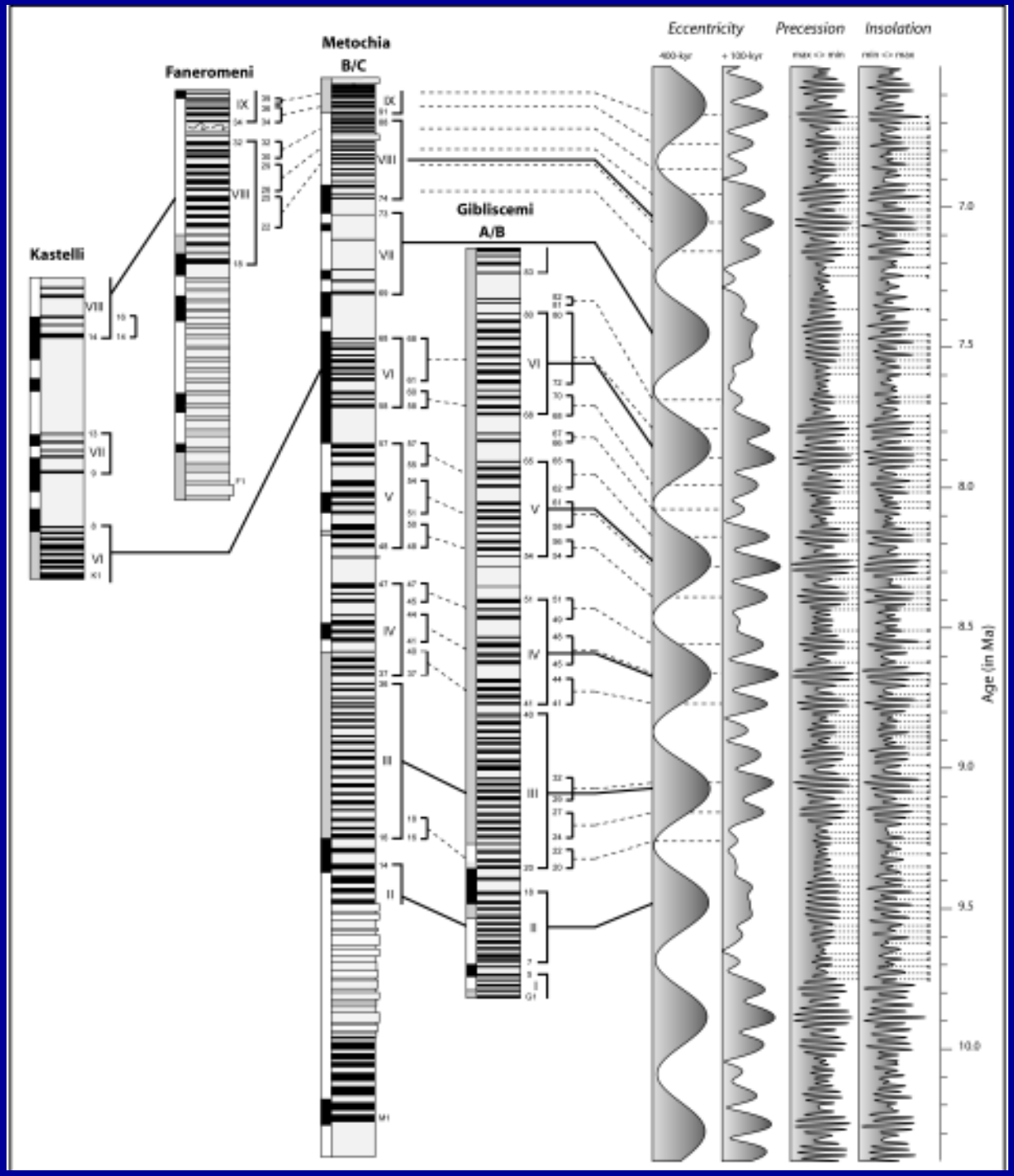
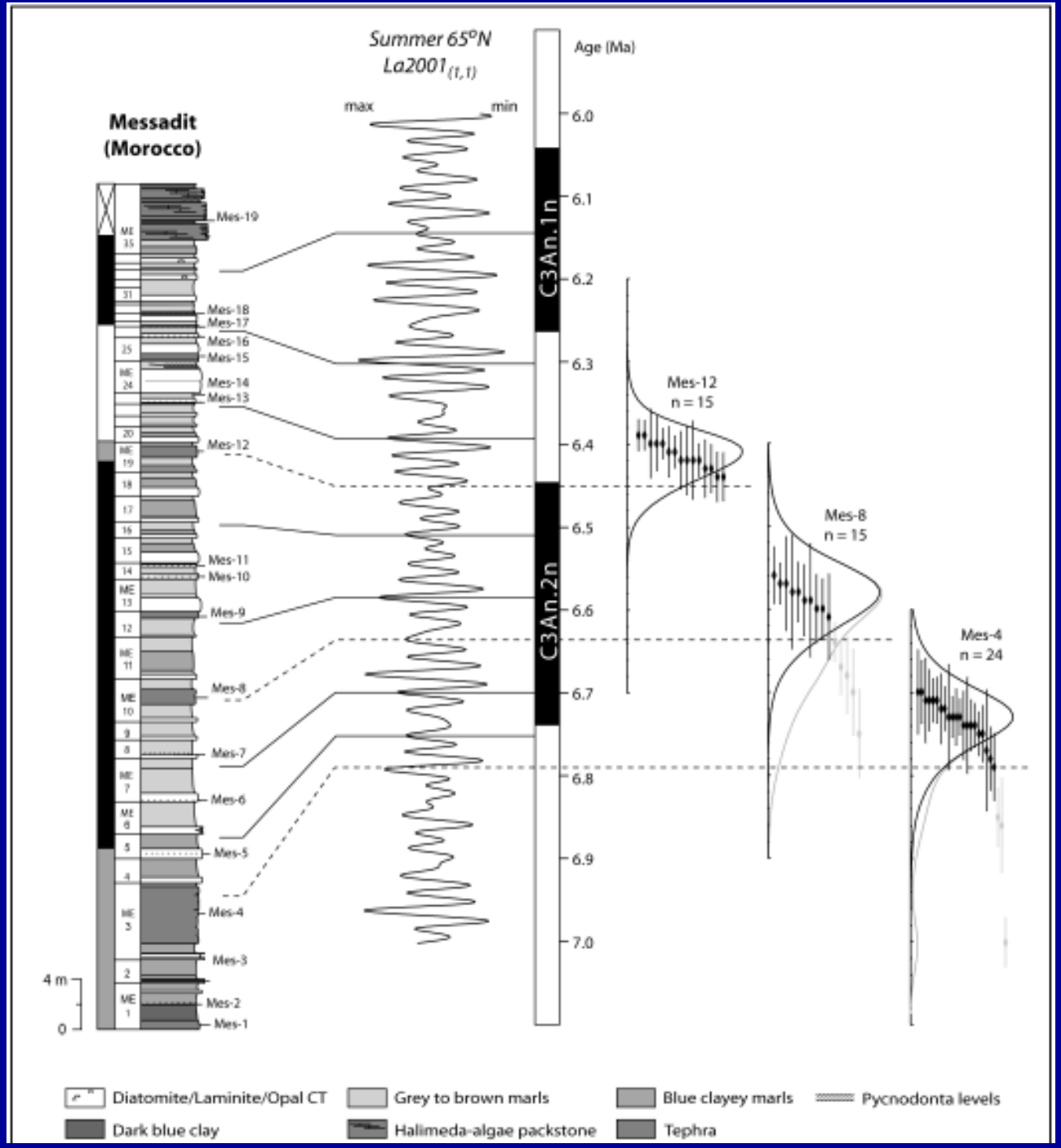
Fig. 4. Construction of basic sedimentary cycles: a) a couplet of sapropel and grey softer marl in the Lower Interval of the Corvi Beach section, b) a tripartite of visible sapropel (in some basic cycles not developed), brown indurated marl and grey softer marl in the Brownish Interval, c) a couplet of sapropel or grey softer marl and whitish to greenish indurated limestone in the Rossini Interval, and d) a couplet of prominent sapropel and whitish limestone and or a tripartite of visible sapropel, prominent sapropel and white limestone in the Euxinic Shale Interval.

Husing et al., 2009



Strasser et al., 2006



Strasser et al., 2006

. Astronomical
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t section in the
Nador Basin and
r ages of inter-
tephra. The cycles
d to the La2004$_{(1,1)}$
(35). The main bio-
hic marker events
d within the studied
and used for high-
n correlations are
rotalia miotumida
irst regular occur-
RO), (2) *G. nicolae*
mmon occurrence
) *G. nicolae* last oc-
(LO), (4) *G. obesa*
Neogloboquadrina
sis sinistral/dextral
change, and (6)
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11, 12, 43). The
elation of the sed-
y cycles to orbital
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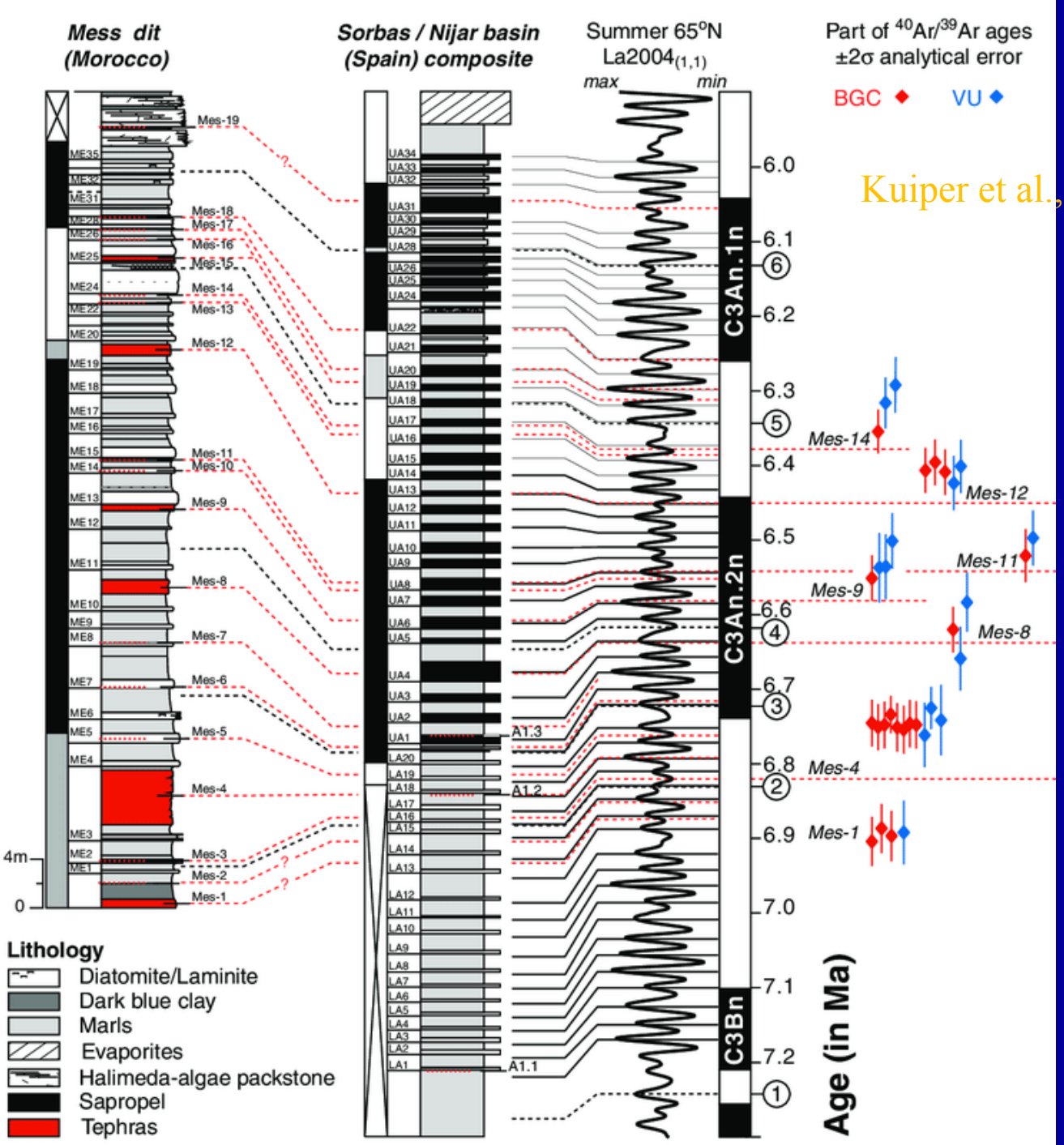

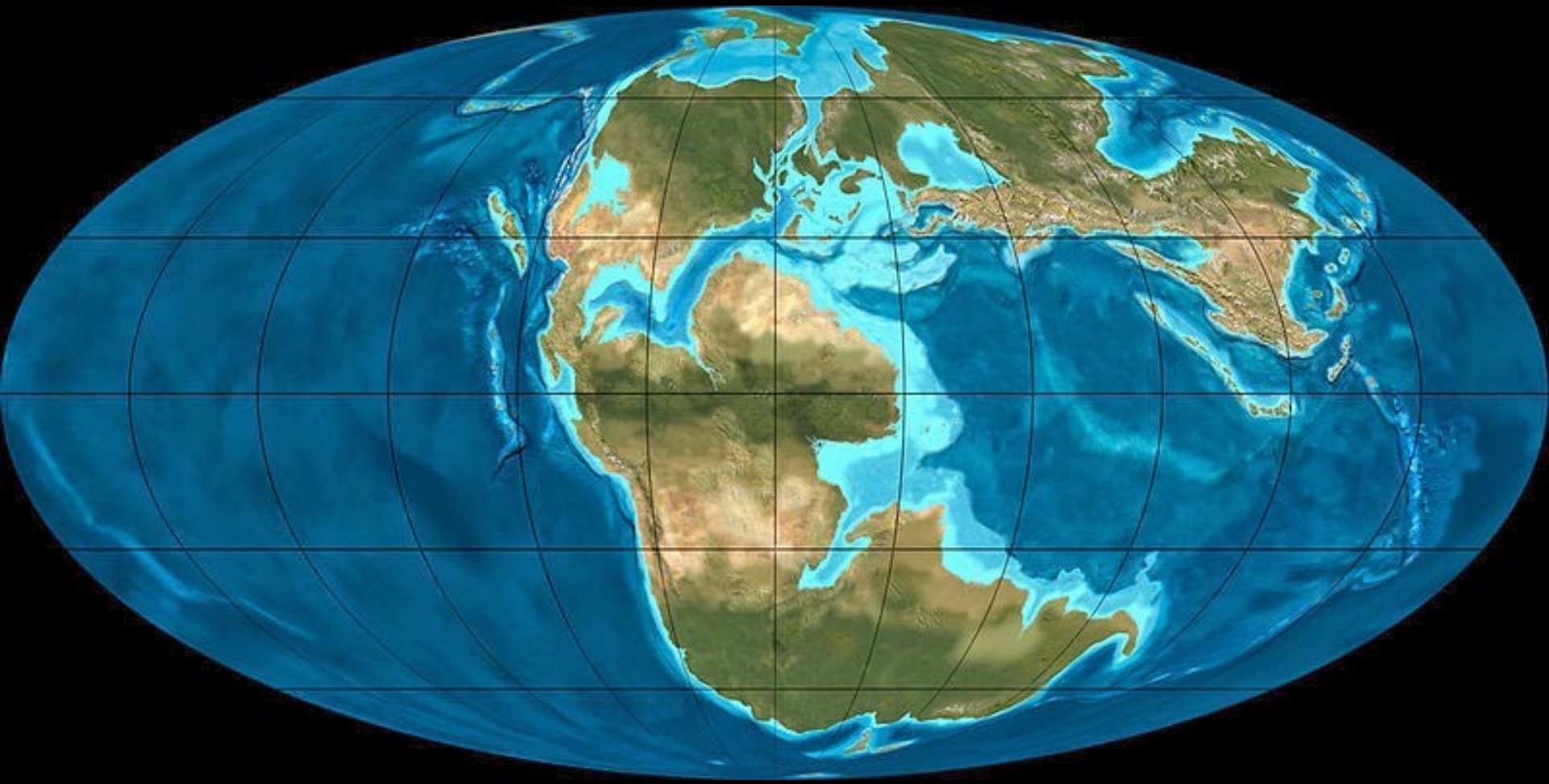

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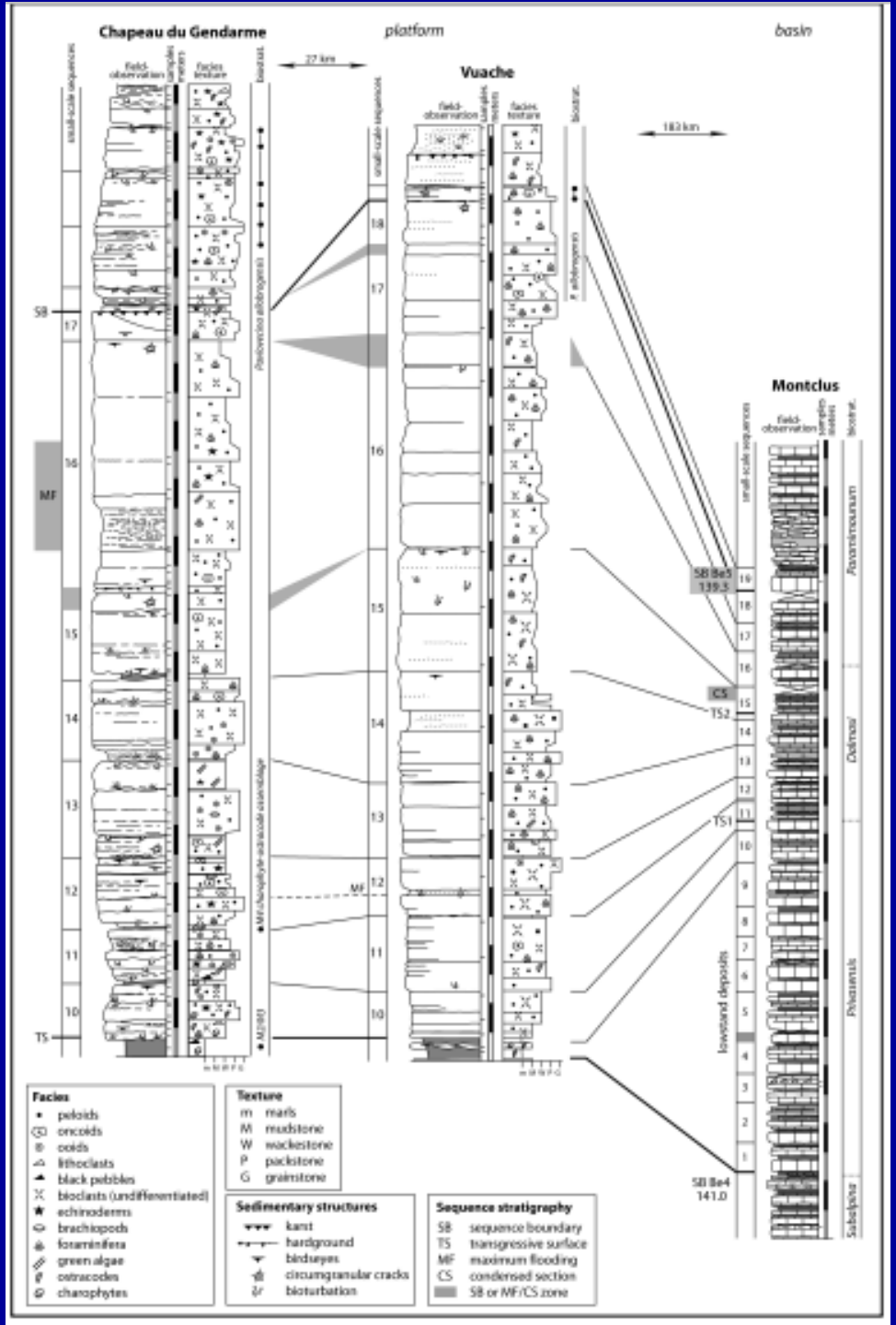


Strasser et al., 2006

Chapeau de gendarme (Jura); https://fr.m.wikipedia.org/

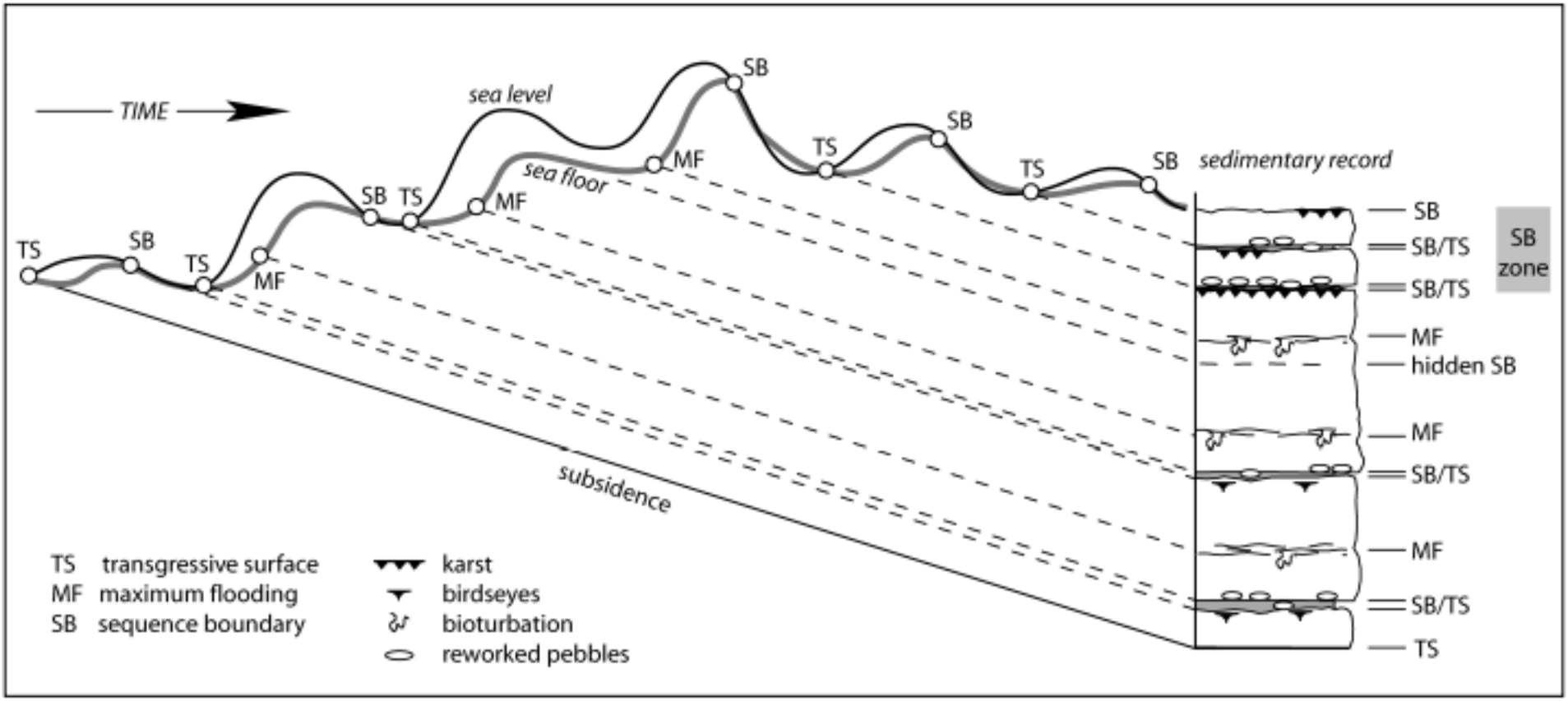
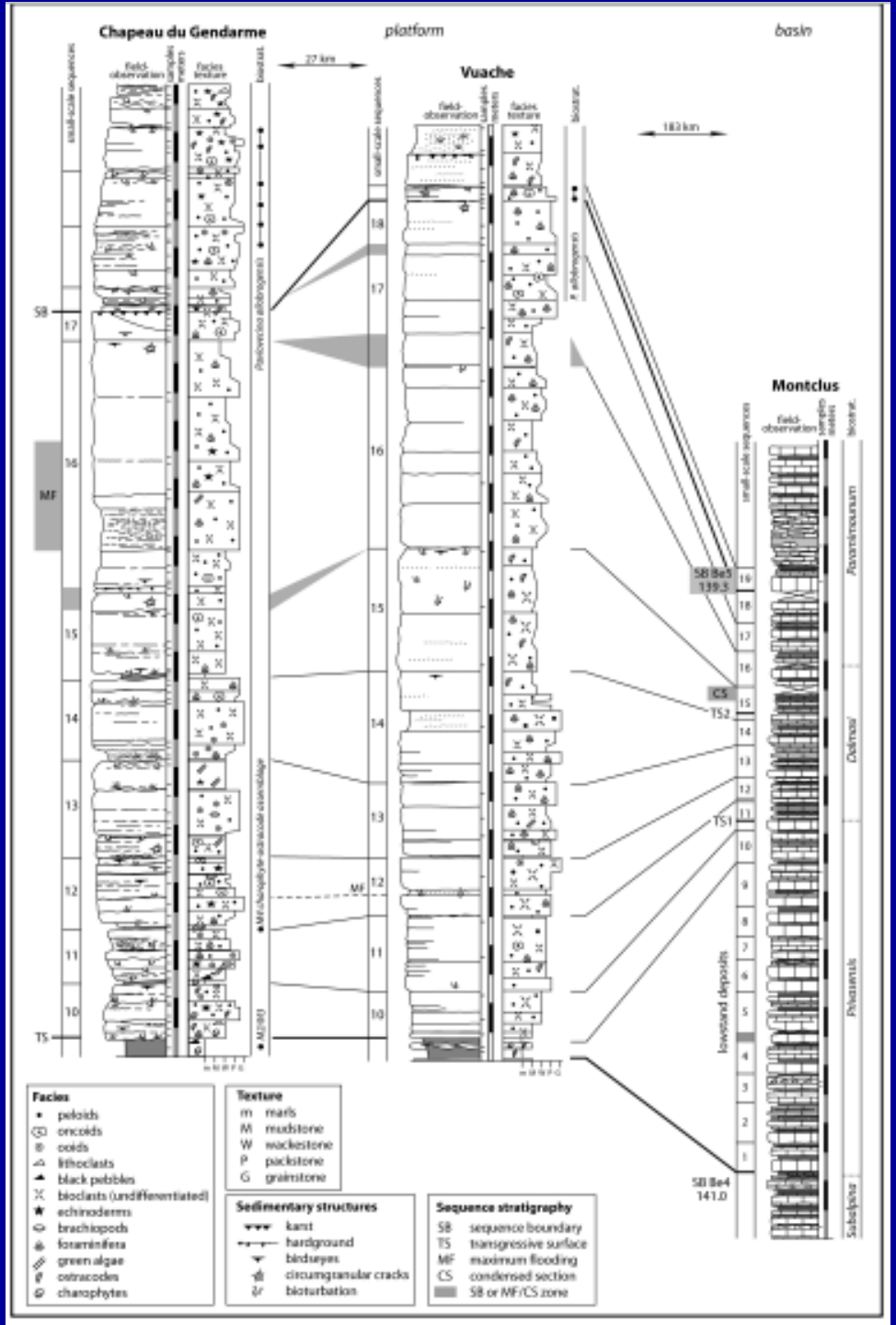


Fig. 11. Formation of hypothetical elementary and small-scale depositional sequences by two superimposed frequencies of sea-level fluctuations in shallow-water carbonate systems. After emersion, a certain lag time is needed before carbonate production starts up and sediment accumulates. When sea-level drops below the sediment surface, erosion occurs for some time, then cementation sets in, and the sediment surface is lowered by chemical dissolution. For simplification, the sedimentary record is not compacted. Modified from STRASSER et al. (2004).

Strasser et al., 2006



Strasser et al., 2006

Pasquier and Strasser, 1997

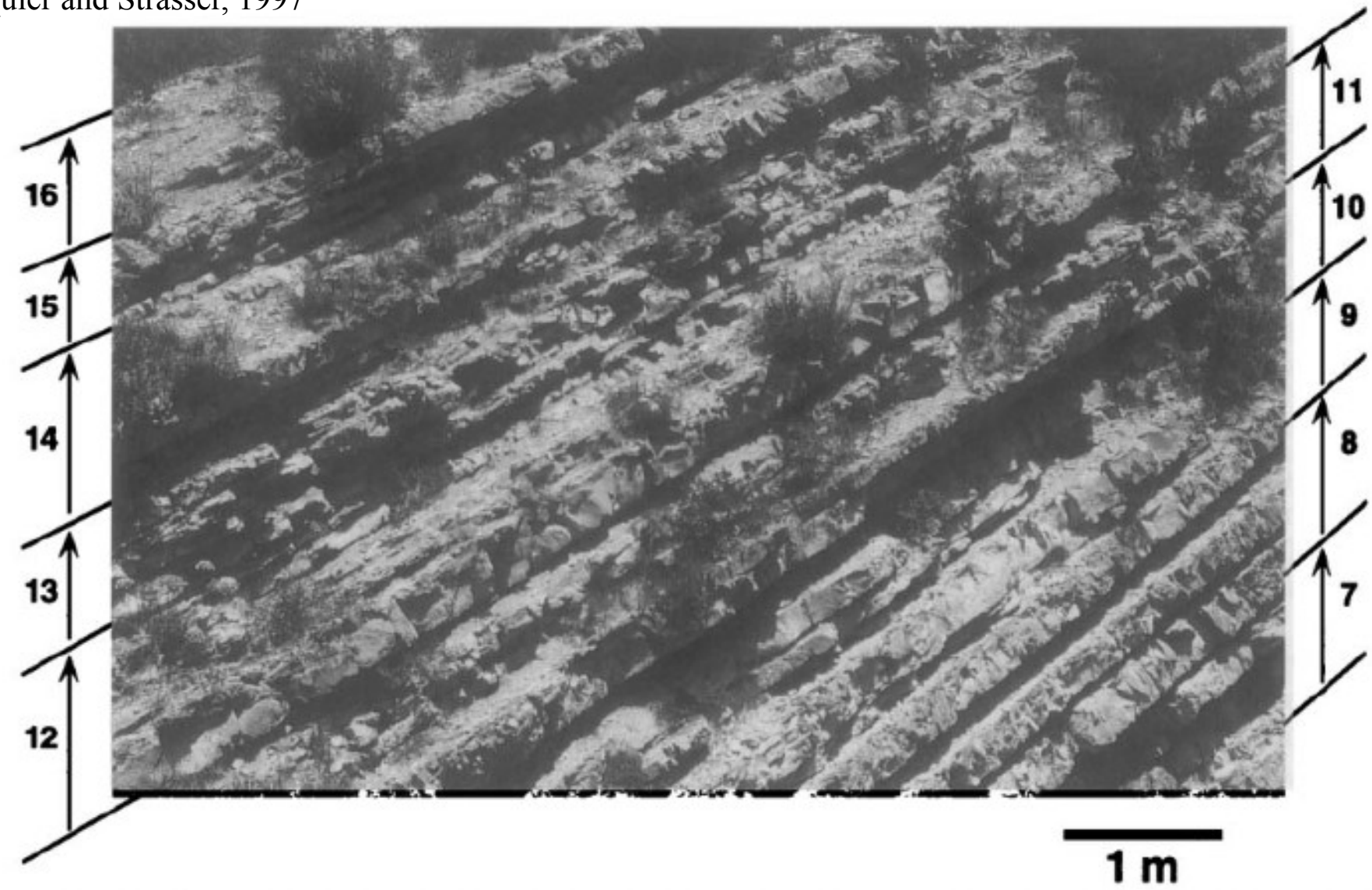


Fig. 7. Outcrop photograph of limestone-marl alternations of basinal facies, Montclus section. One limestone-marl couplet is considered as an elementary sequence. The numbering of the small-scale composite sequences corresponds to the one given in Fig. 6.

Pasquier and Strasser, 1997

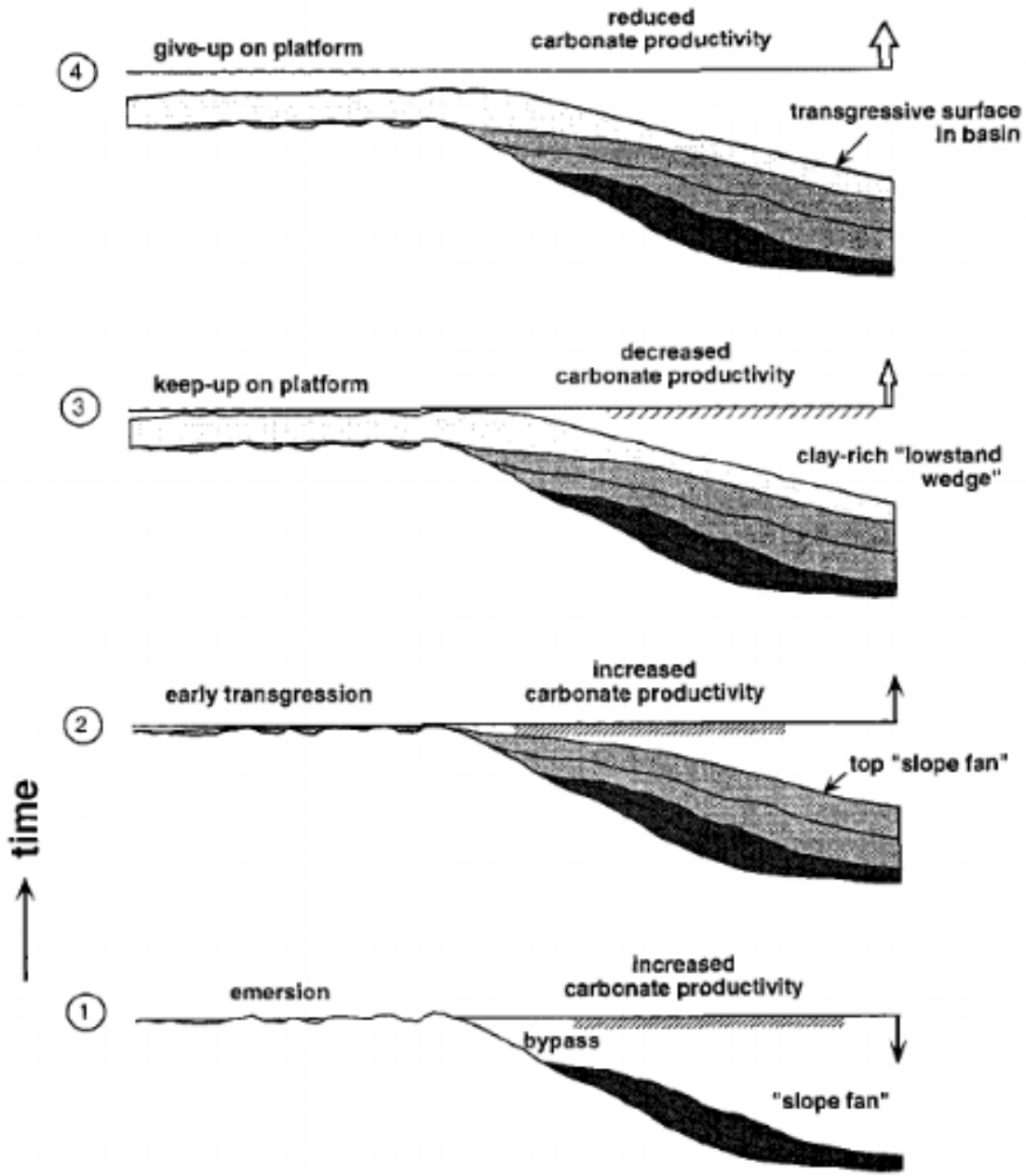
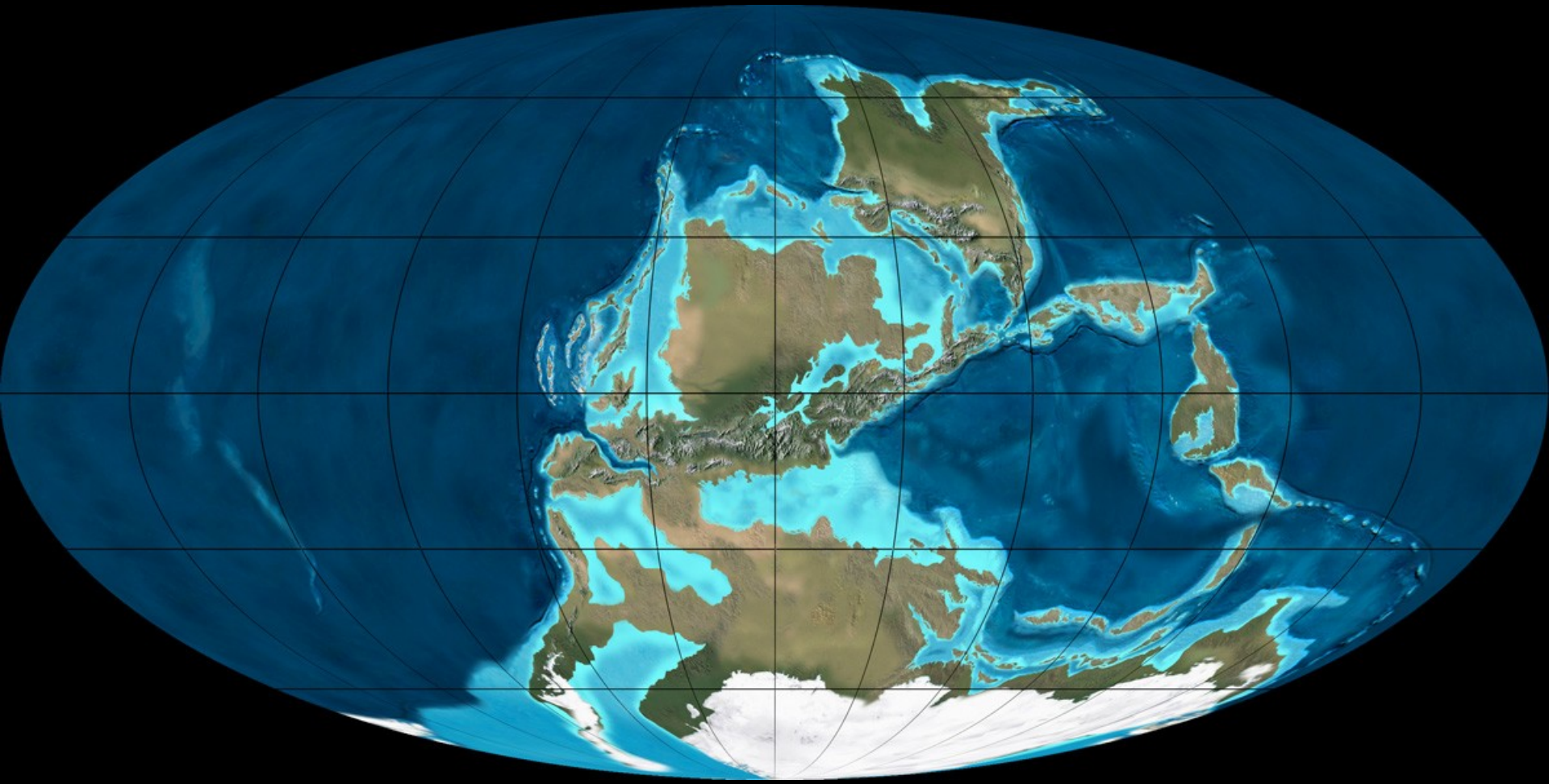
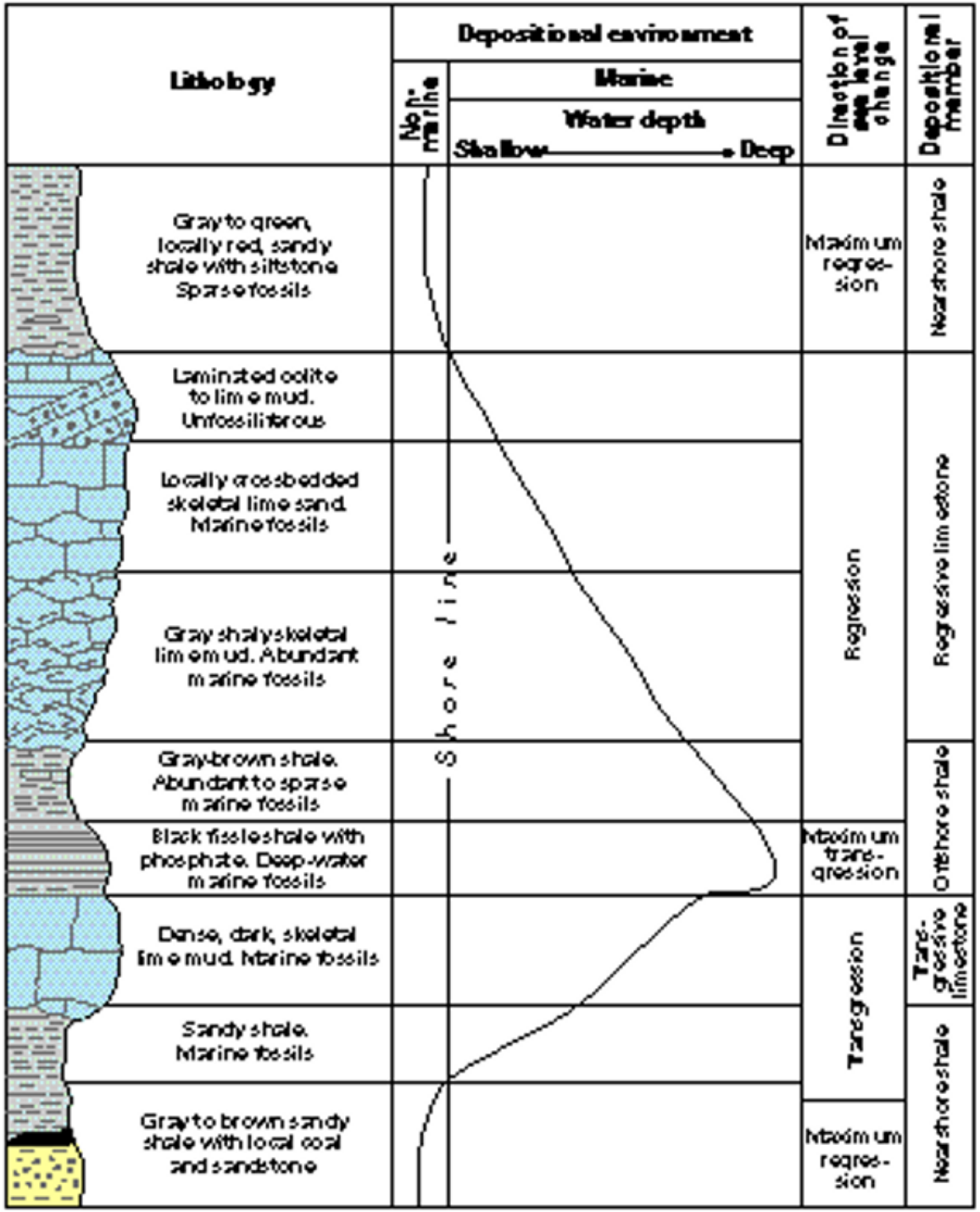


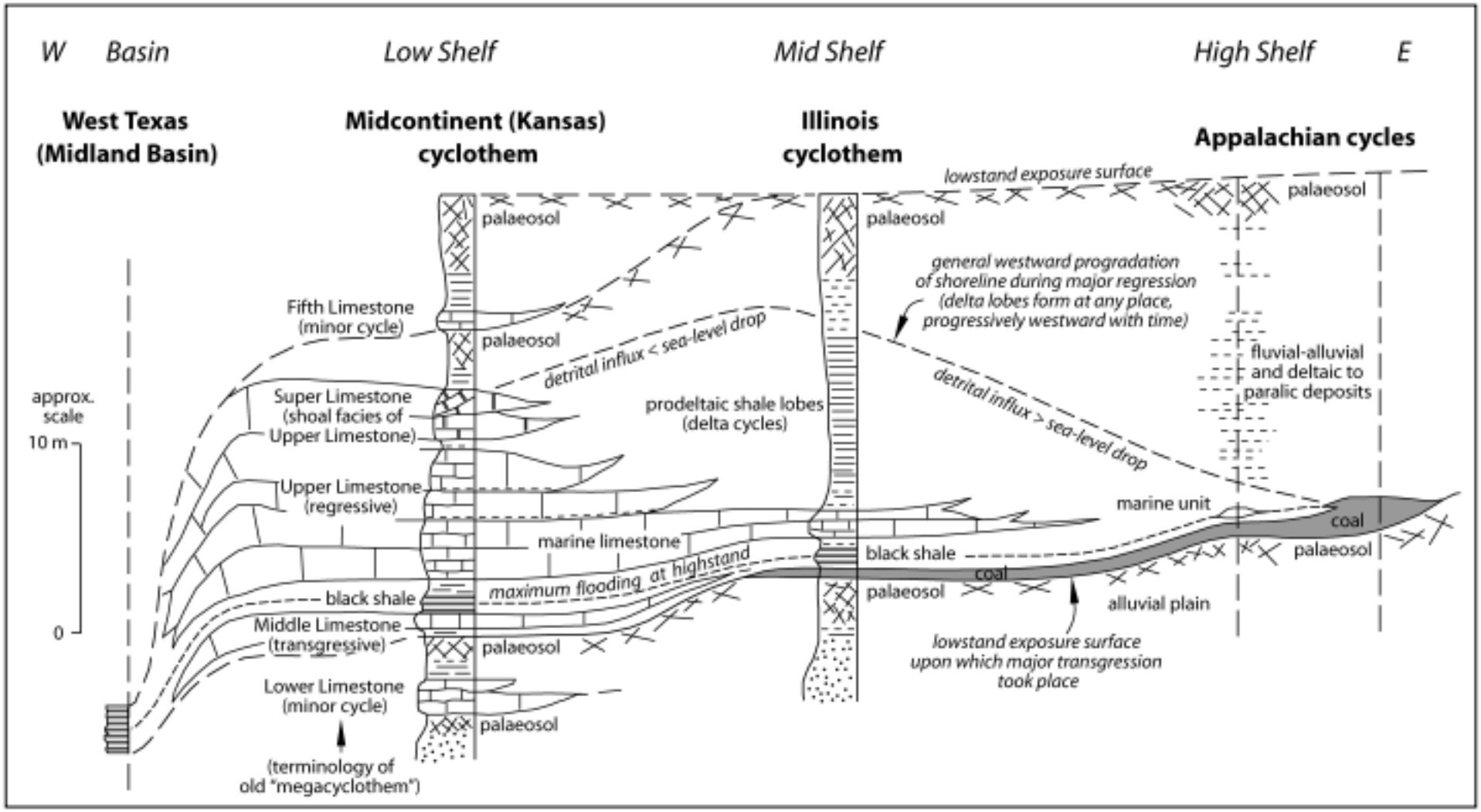
Fig. 15. Conceptual model of the evolution of the studied 3rd-order sequence. For explanation refer to text.



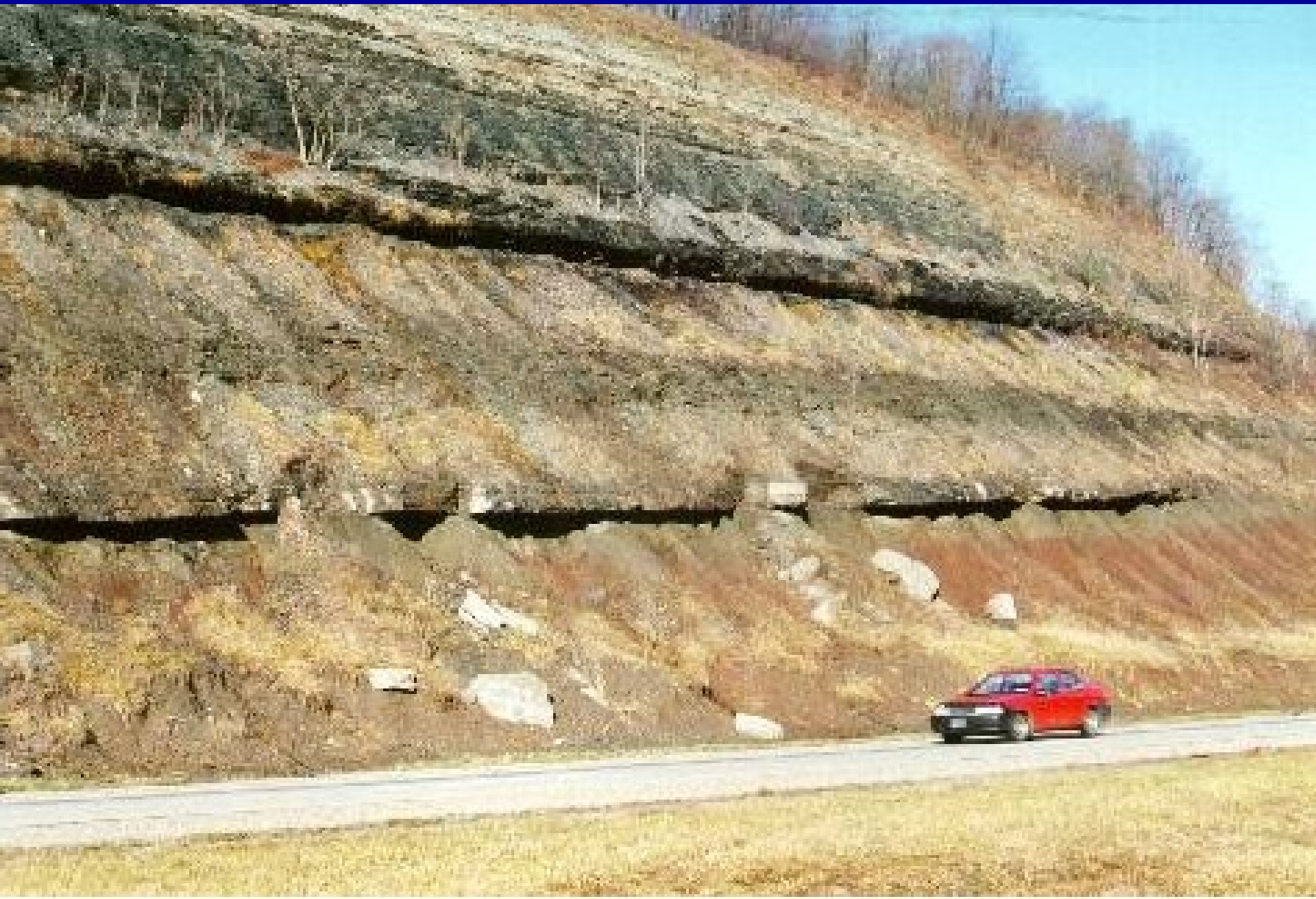


Modified from Ebanks, W.J., Jr., Brady, L.L., Heckel, P.H., O'Connor, M.G., Sanderson, G.A., West, R.R., and Wilson, F.W., 1979, The Mississippian and Pennsylvanian (Carboniferous) Systems in the United States—Kansas: U.S. Geological Survey Professional Paper 1110-Q, 30p.

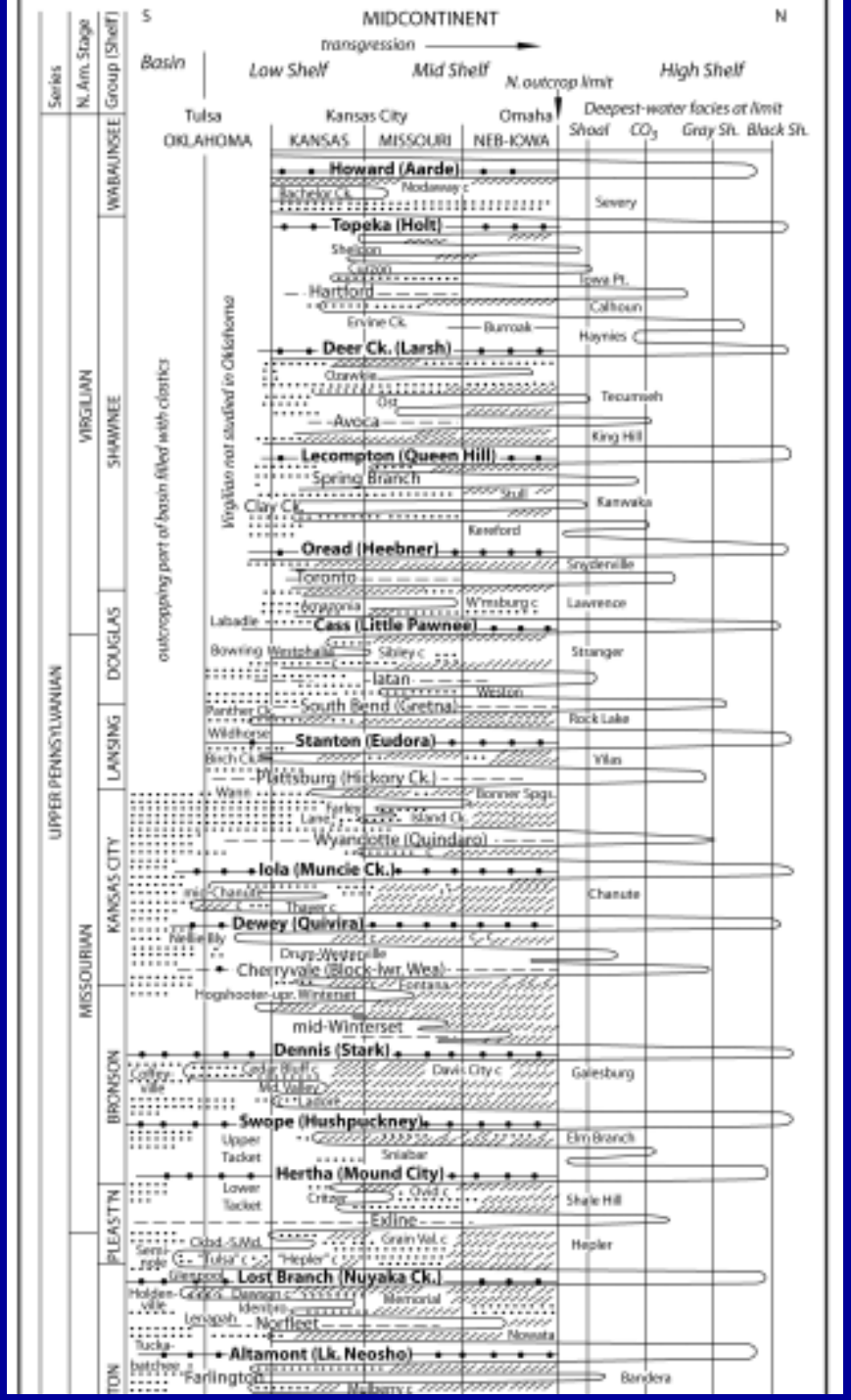
Figure 10. Pennsylvanian strata in the segment were deposited mostly as a series of sedimentary sequences called cyclothems, each of which is the result of a transgression and regression of the sea; they are best preserved in Kansas. The nonmarine shale and coal represent a swampy, deltaic environment; the limestone beds represent deposition in marine waters of shallow to intermediate depth; and the black shale represents a deep marine environment.

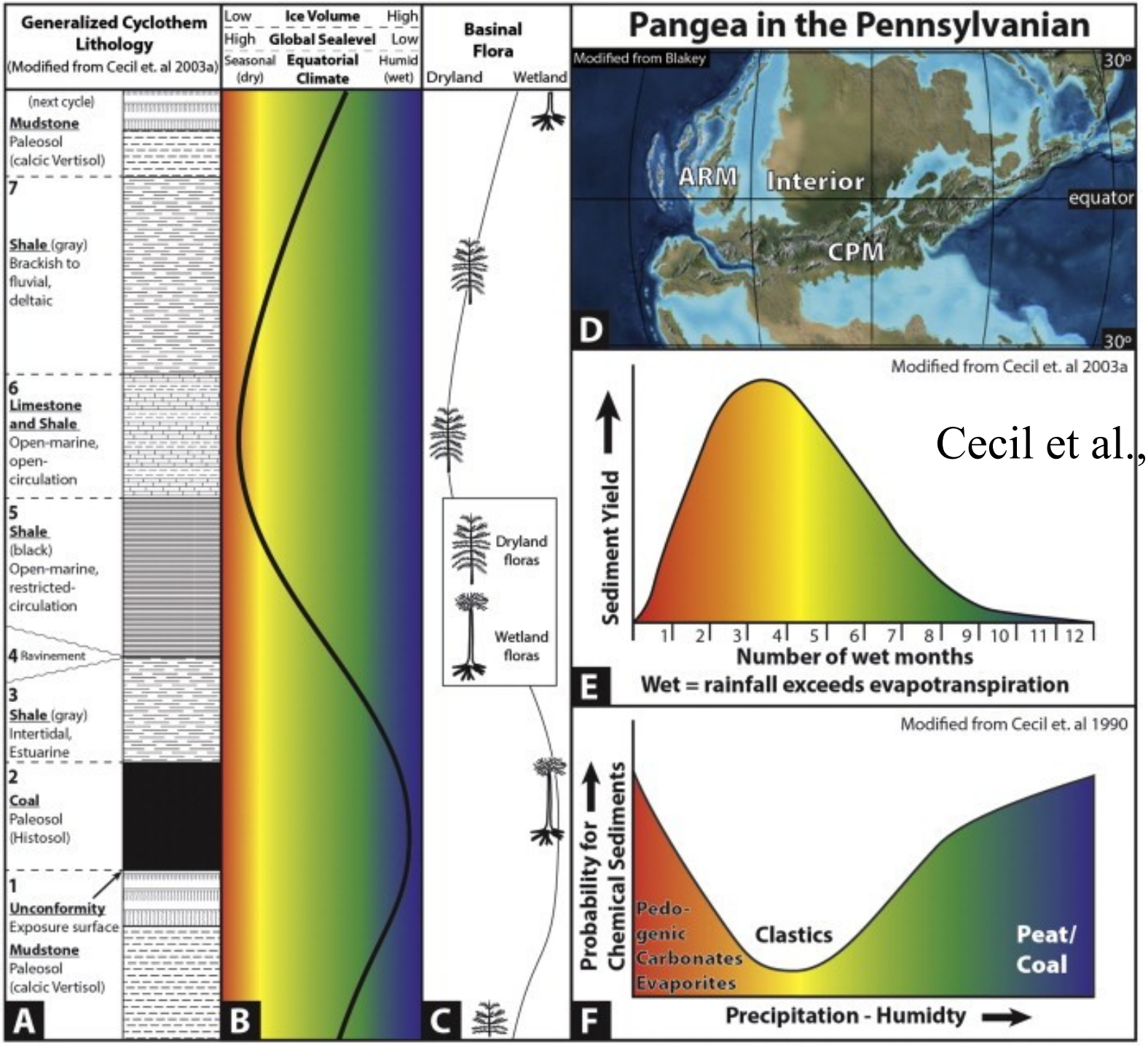


Strasser et al., 2006

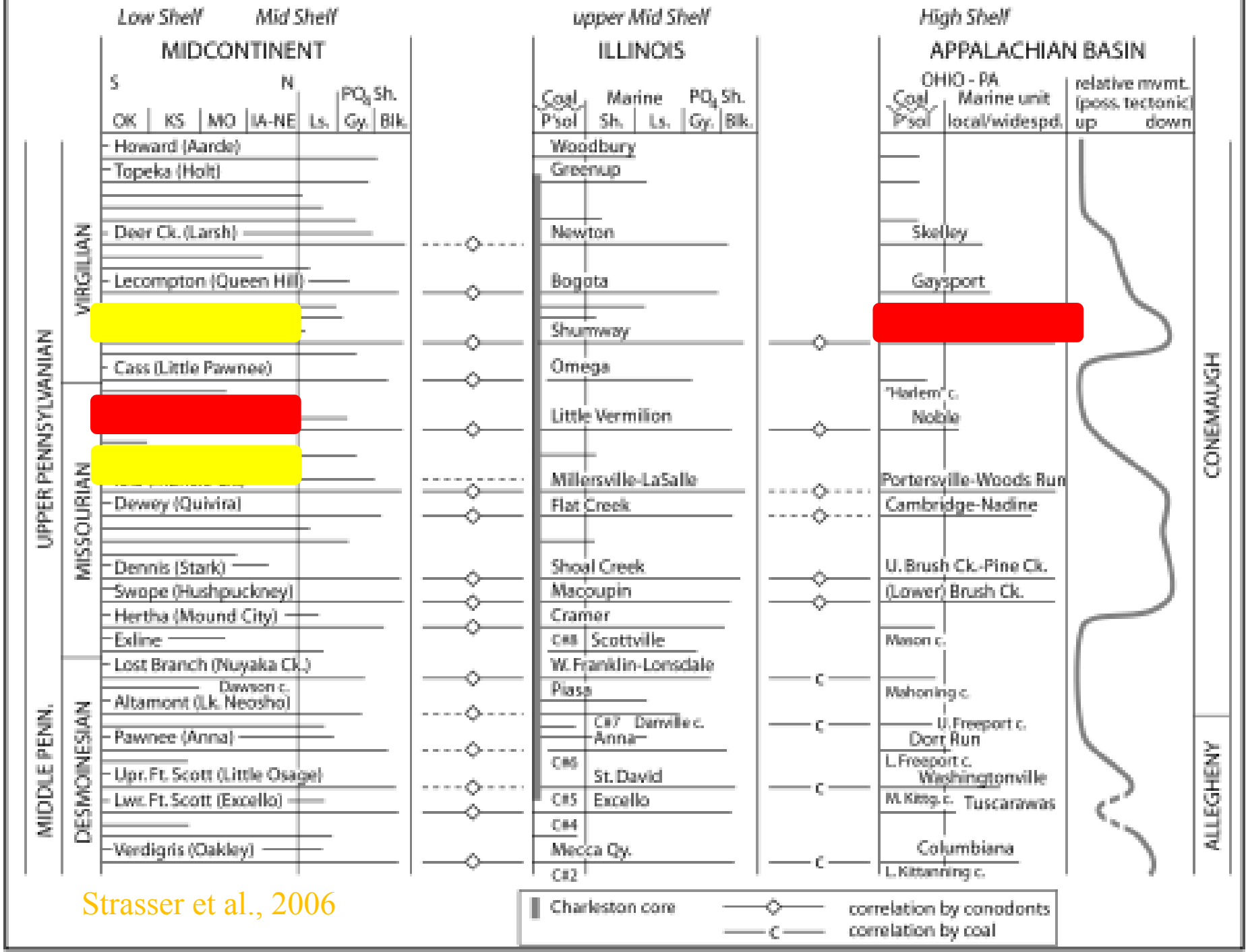


Ames Limestone, top of Glenshaw Formation, Conemaugh Group, Allegheny County, PA


MIDCONTINENT
S
N
transgression
Basin
Low Shelf
Mid Shelf
N. outcrop limit
High Shelf
Deepest-water facies at limit
Series
N. Am. Stage
Group (Shelf)
Tulsa
Kansas City
Omaha
OKLAHOMA
KANSAS
MISSOURI
NEB-IOWA
Shoal
CO_3
Gray Sh.
Black Sh.
UPPER PENNSYLVANIAN
MISSOURIAN
VIRGILIAN
WABAUNSEE
SHAWNEE
DOUGLAS
LANSING
KANSAS CITY
BRONSON
PLEASTN
TON
Howard (Aarde)
Topeka (Holt)
Deer Ck. (Larsh)
Lecompton (Queen Hill)
Oread (Heebner)
Cass (Little Pawnee)
Stanton (Eudora)
Iola (Muncie Ck.)
Dewey (Quivira)
Dennis (Stark)
Swope (Hushpuckney)
Hertha (Mound City)
Lost Branch (Nuyaka Ck.)
Altamont (Lk. Neosho)
Virgilian not studied in Oklahoma
outcropping part of basin filled with clastics
Severy
Tecumseh
King Hill
Kanwaka
Lawrence
Stranger
Rock Lake
Ylias
Chanute
Galesburg
Elm Branch
Shale Hill
Hepler
Bandera
Strasser et al., 2006

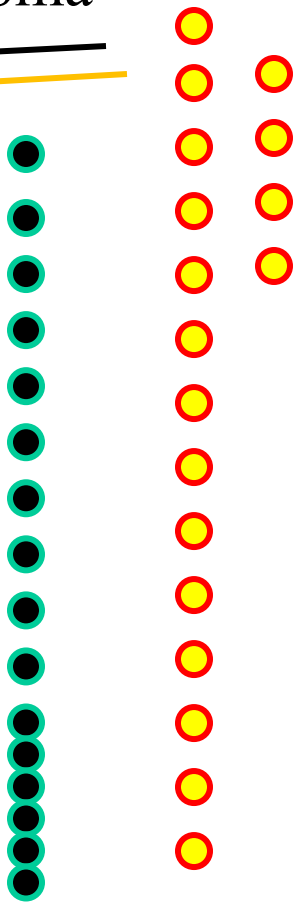


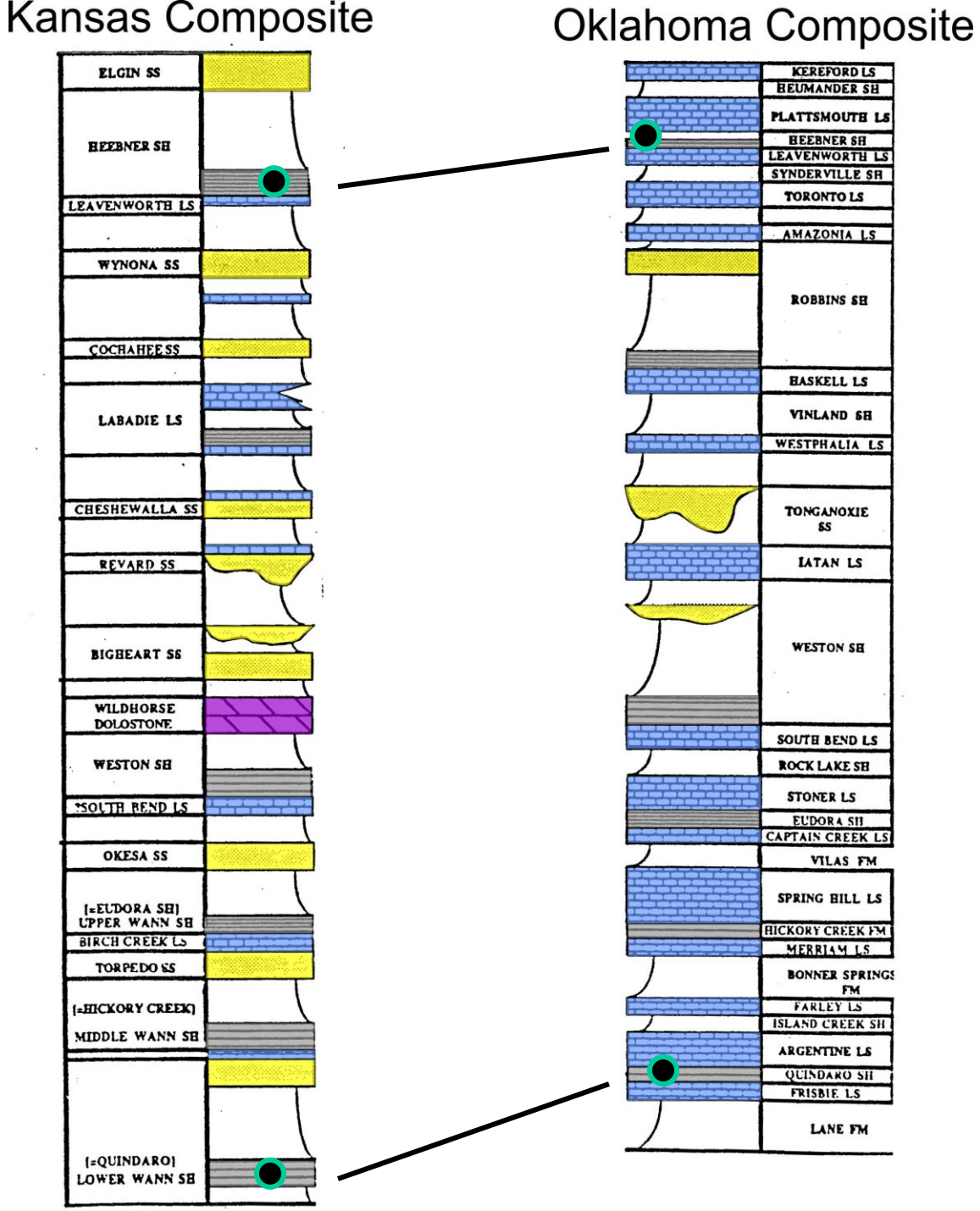
Cecil et al., 2014

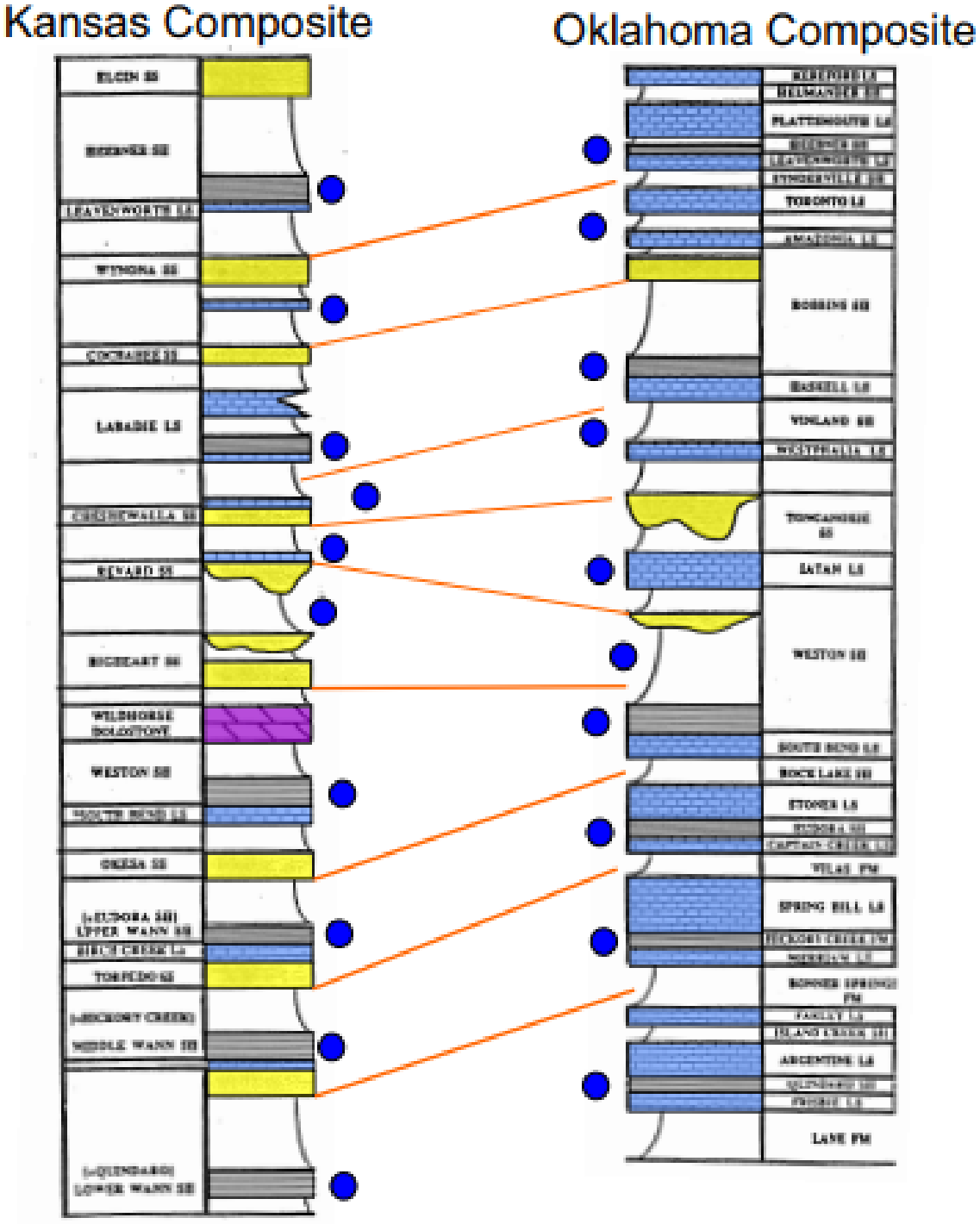


Strasser et al., 2006

Correlation problem: Carboniferous strata in Kansas-Oklahoma






Kansas Composite
Oklahoma Composite
ELGIN SS
LEAVENWORTH LS
WYNONA SS
LABARGE LS
REVARD SS
WILDHORSE DOLOSTONE
WESTON SS
OREAD SS
TORPEDO SS
ROBBINS SS
TOKIO FM
SPRING HILL LS
ARGENTINE LS
LANE FM