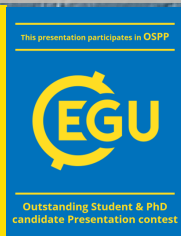


# Evolution of the Nile River since 70 Ma: insights from surface processes and anorogenic reliefs controlled by mantle dynamics

Iwan Setiawan<sup>1</sup>, François Guillocheau<sup>1</sup>, Cécile Robin<sup>1</sup>, Jean Braun<sup>2</sup>

<sup>1</sup> CNRS, Géosciences Rennes, UMR6118, Université de Rennes 1, Rennes, 35042, France

<sup>2</sup> Helmholtz Centre Potsdam, German Research Centre for Geosciences (GFZ),  
Telegrafenberg, Potsdam 14473, Germany

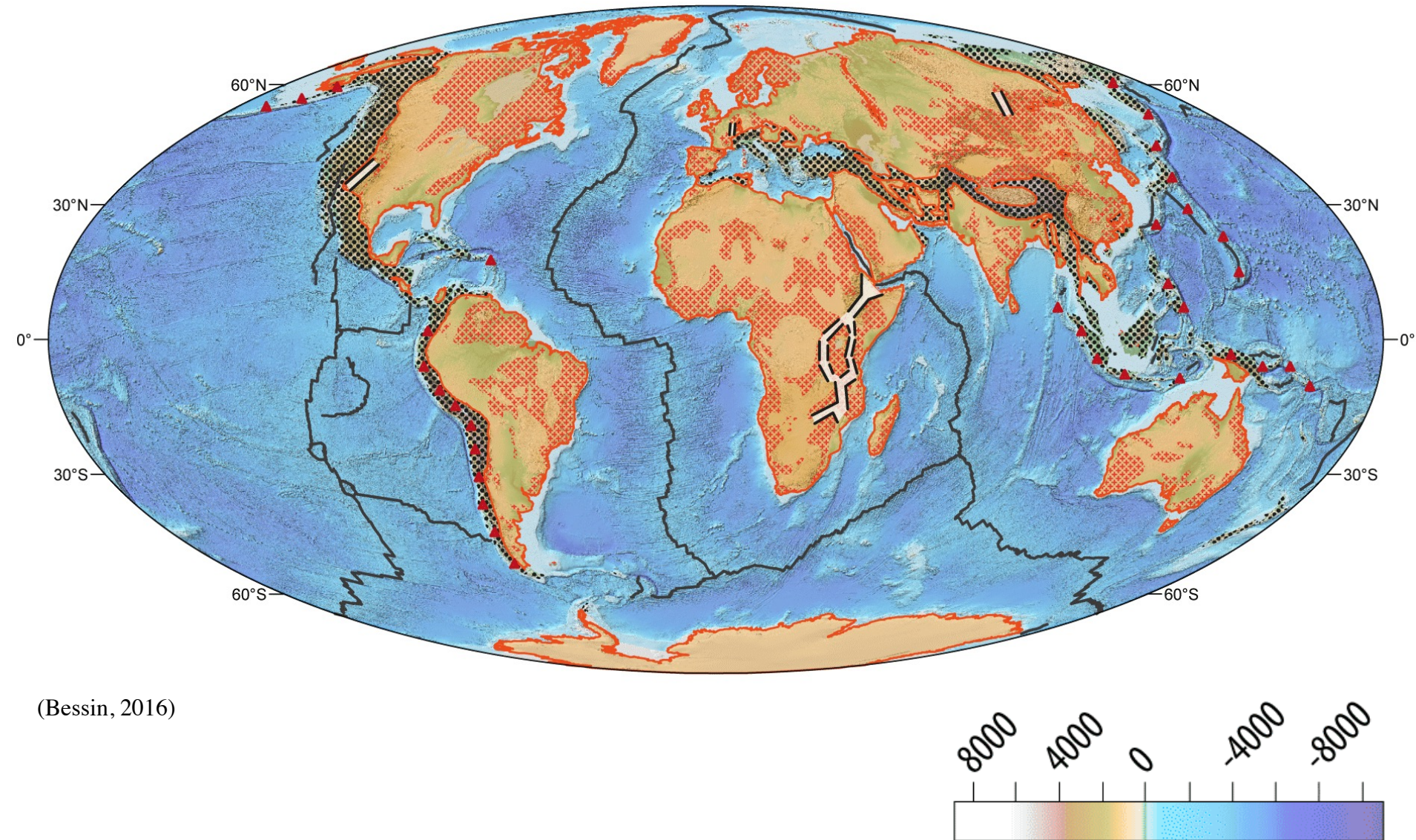


"The project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie Grant Agreement No. 860383



# PLATEAUS: WORLD DISTRIBUTIONS

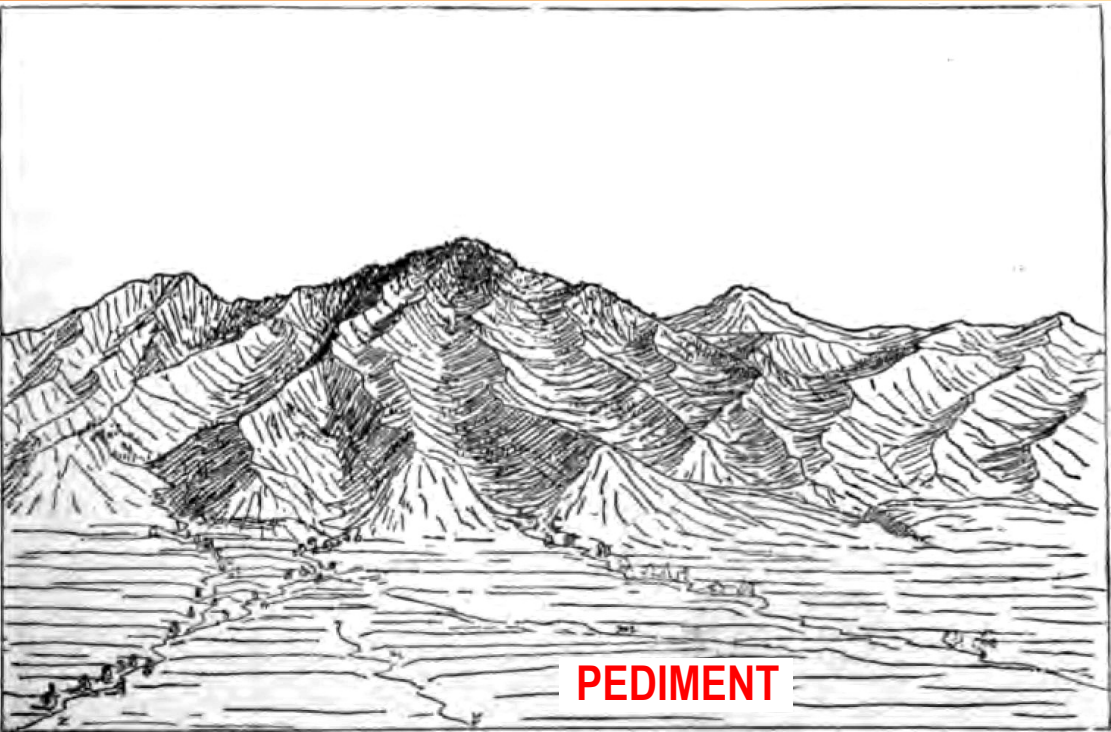
2





# PEDIMENT: defined by G. K. GILBERT (1877, 1882)

3



DEPARTMENT OF THE INTERIOR.  
U. S. GEOGRAPHICAL AND GEOLOGICAL SURVEY OF THE ROCKY MOUNTAIN REGION.  
J. W. POWELL, IN CHARGE.

## REPORT

ON THE

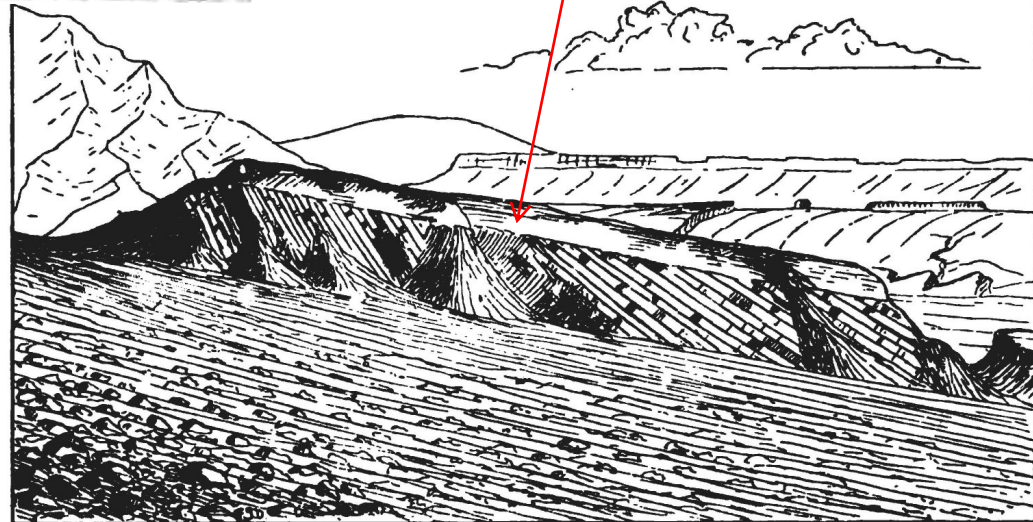
## GEOLOGY OF THE HENRY MOUNTAINS.

By G. K. GILBERT.



WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1877.

## EROSIONAL SURFACE



SECOND ANNUAL REPORT

OF THE

UNITED STATES GEOLOGICAL SURVEY

TO THE

SECRETARY OF THE INTERIOR

1880-'81

BY

J. W. POWELL

WASHINGTON



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1882

CONTRIBUTIONS

TO THE

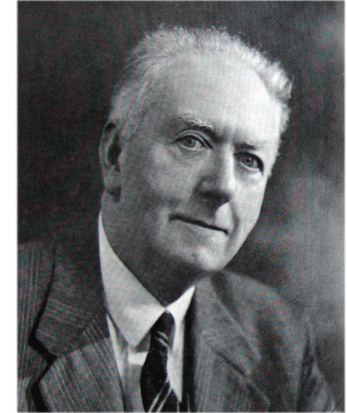
HISTORY OF LAKE BONNEVILLE.

BY

G. K. GILBERT.

# “BASIN AND SWELL” STRUCTURE OF AFRICA

4

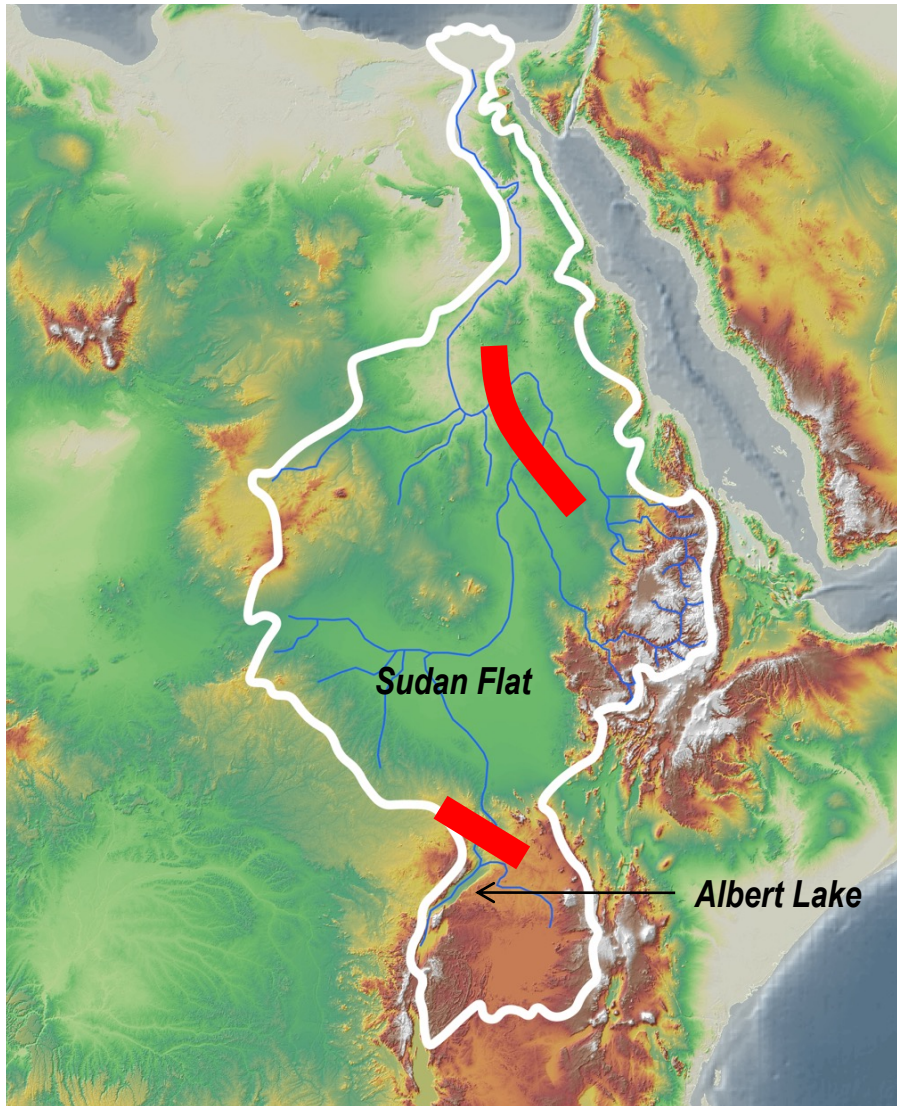


A. HOLMES (1944)

## A **BASIN AND SWELL** PATTERN

- ✓ **VERY LONG WAVELENGTH**  
(x1000 km) **TOPOGRAPHY**
- ✓ **LARGE RIVERS**



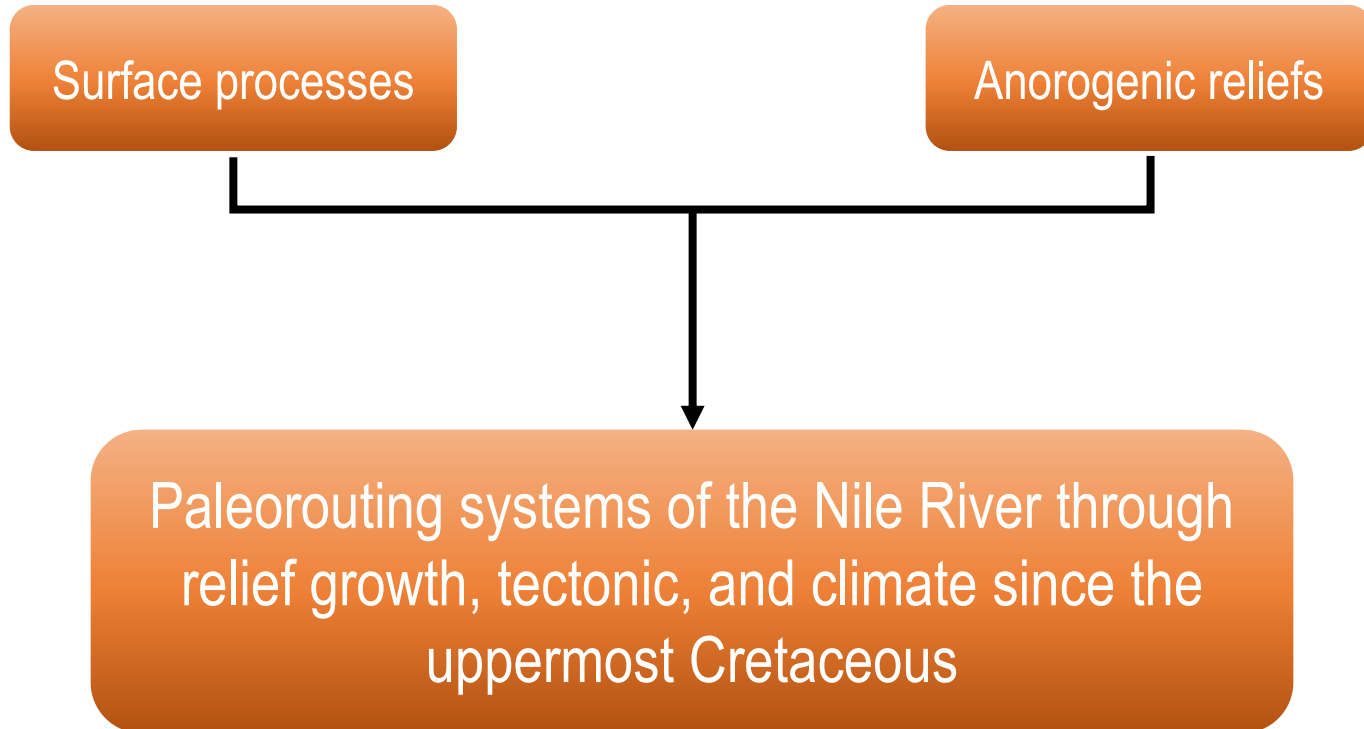


## THE NILE

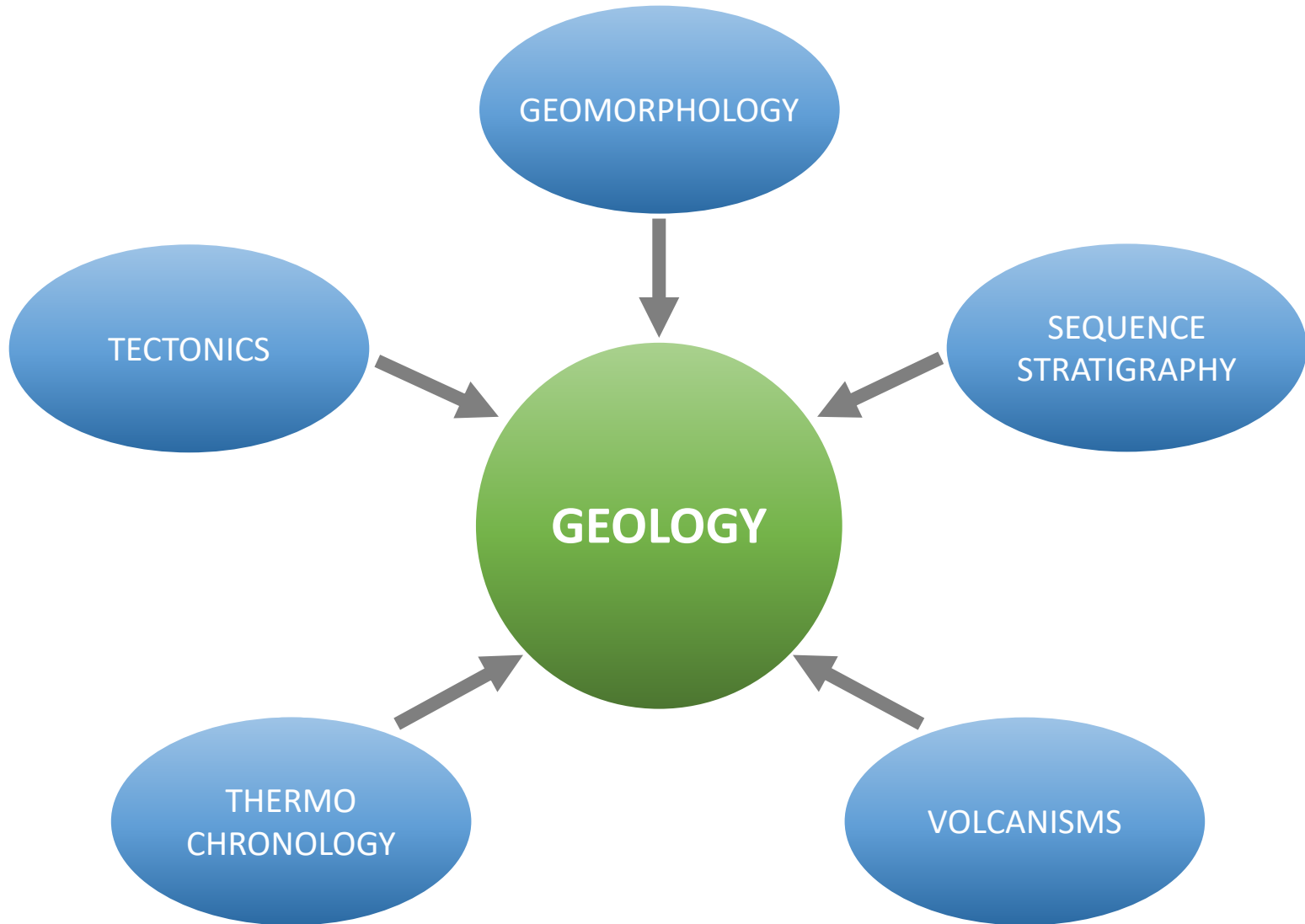
**a river profile  
crossing two subsiding domains**

- ✓ a set of two endhoreic systems captured from the north?
- ✓ buffer effect of the along Nile subsiding basins?
- ✓ a system related to the Ethiopian Plume (33 Ma) or younger?
- ✓ Effect of the Neogene aridification?





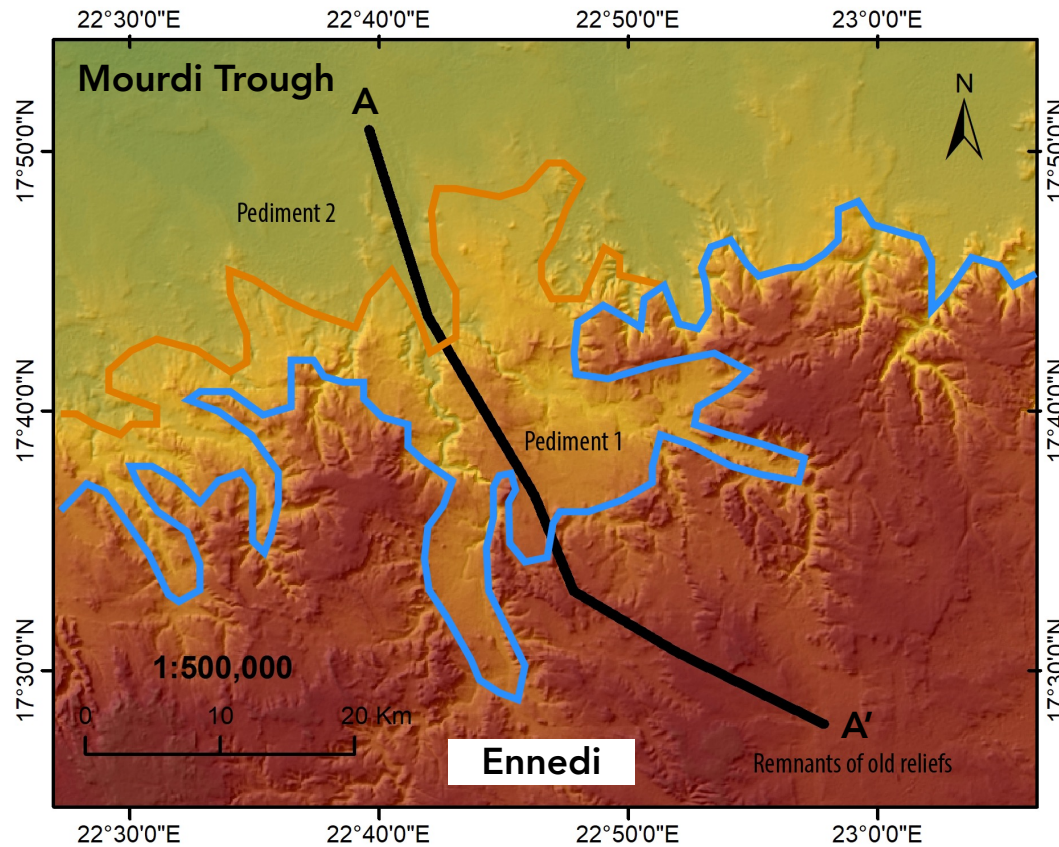






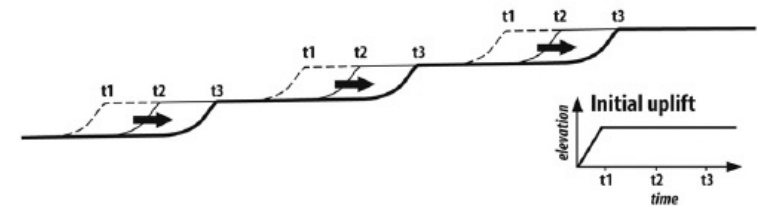
# GEOMORPHOLOGICAL ANALYSIS

8

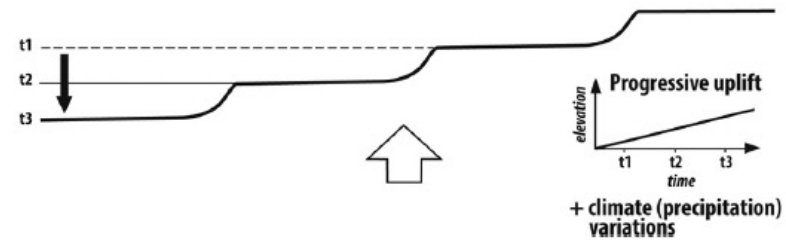


## b POSSIBLE PEDIMENTS EVOLUTION TROUGH TIME

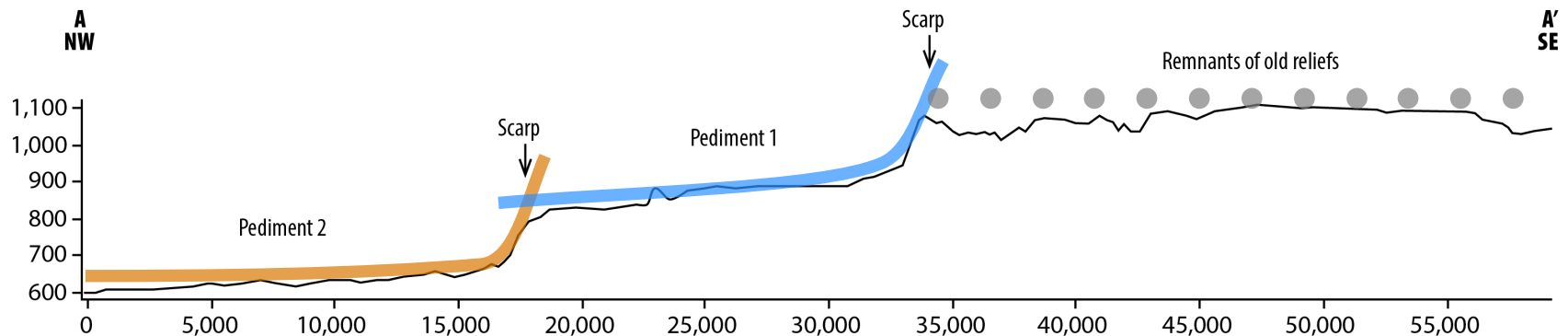
### SYNCHRONOUS SCARP RETREAT



### SUCCESSIVE PEDIMENT FORMATION



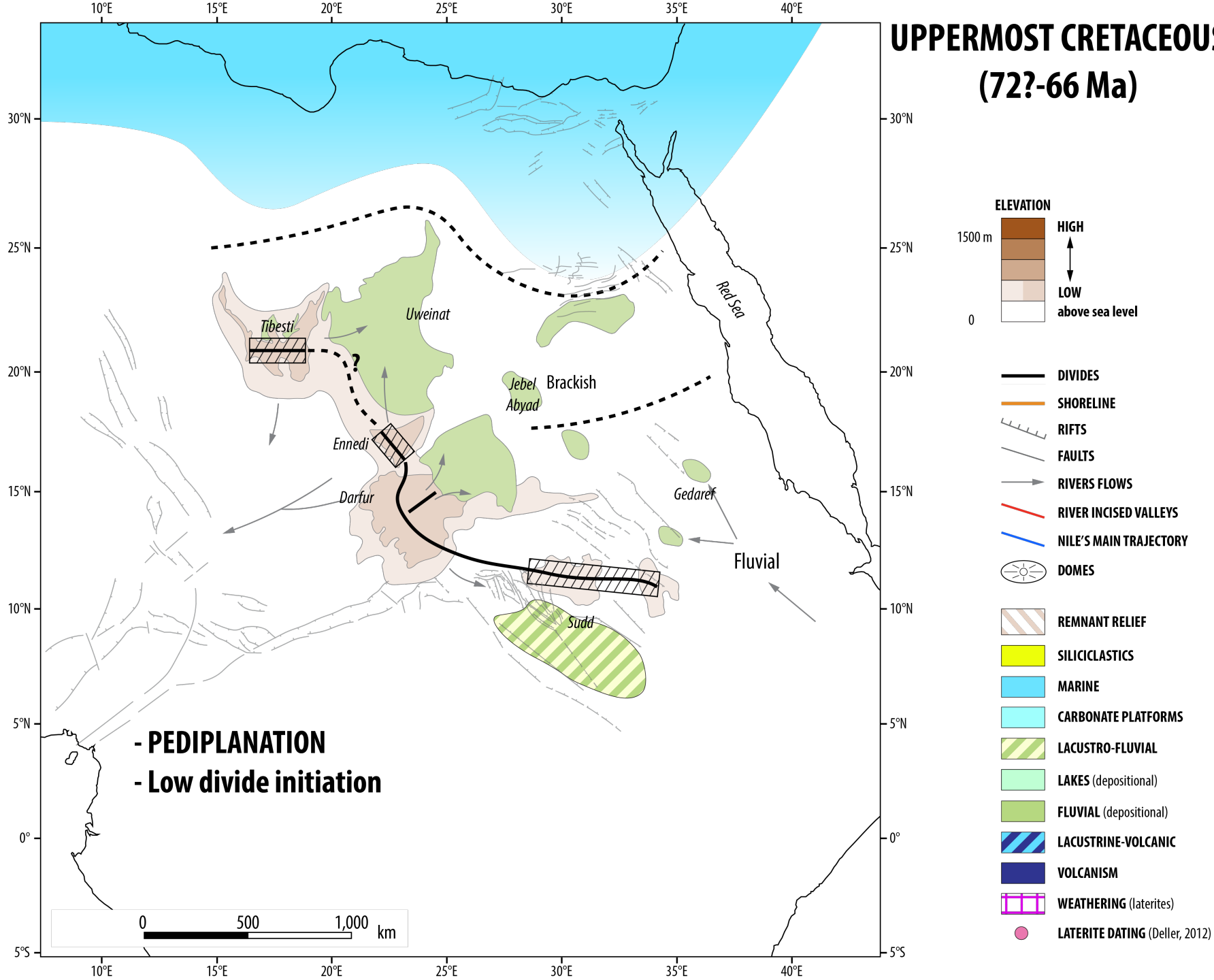
(Guillocheau *et al.*, 2018)



# **NILE PALEOGEOGRAPHY**

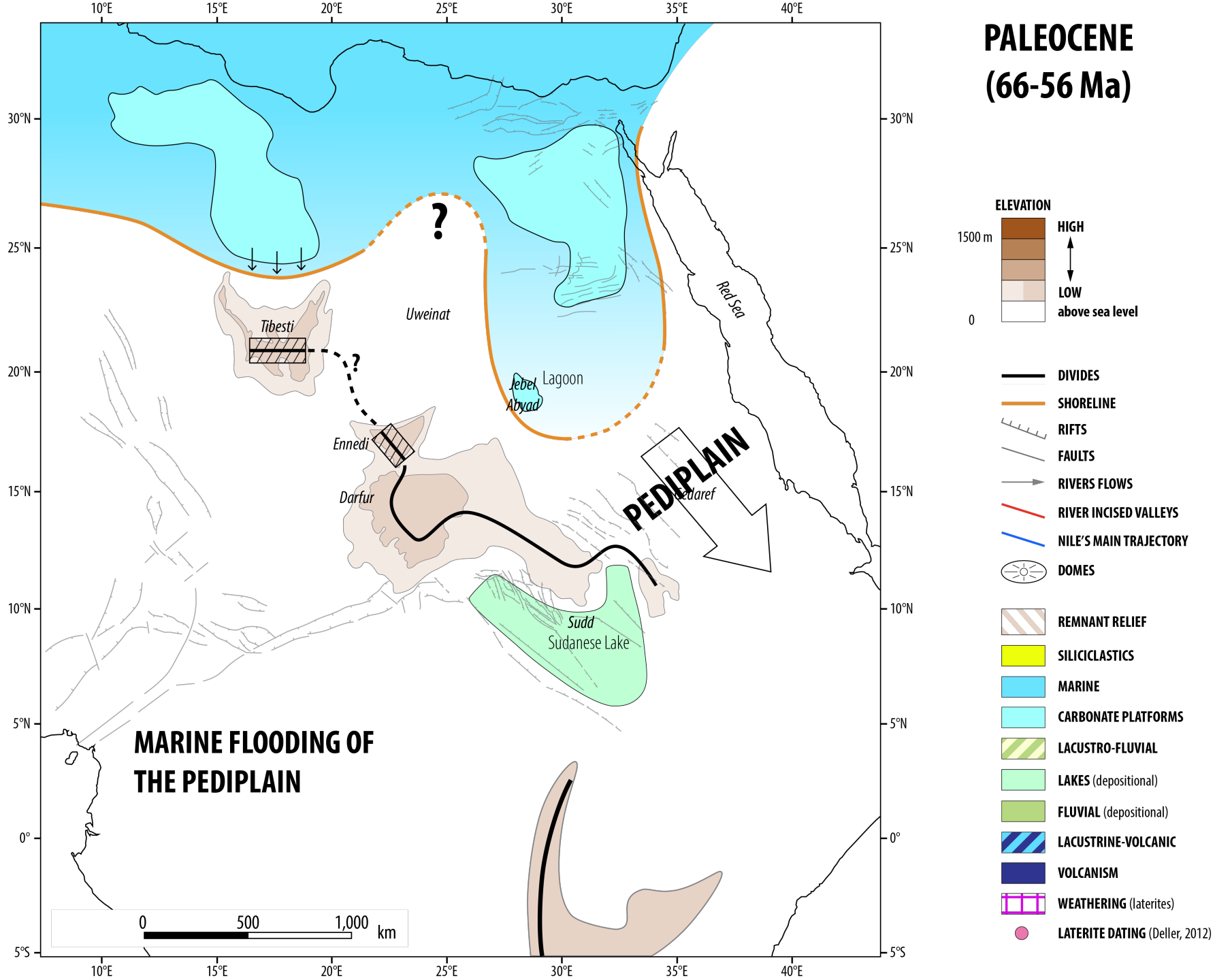


# UPPERMOST CRETACEOUS 10 (72?-66 Ma)



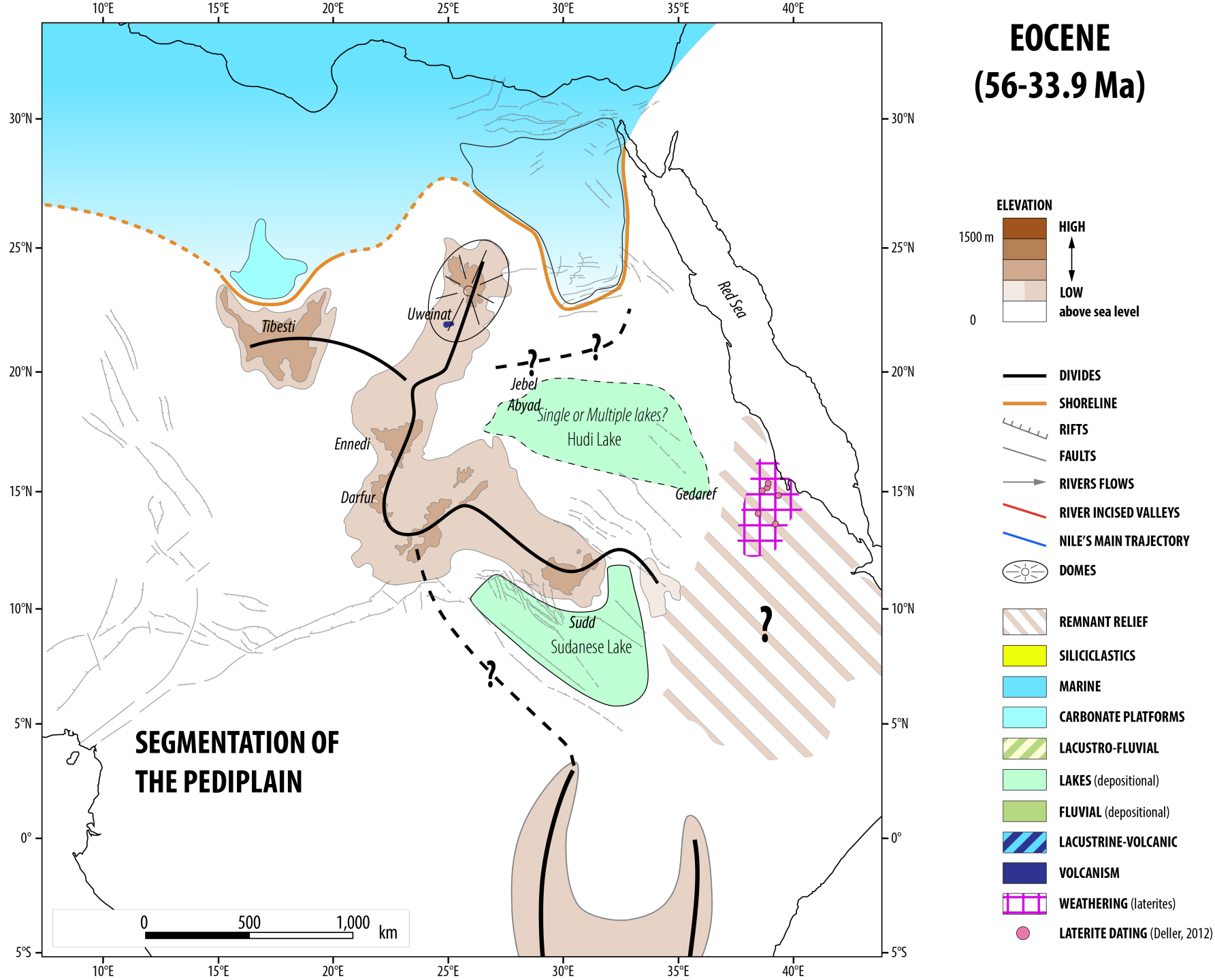
# PALEOCENE (66-56 Ma)

11



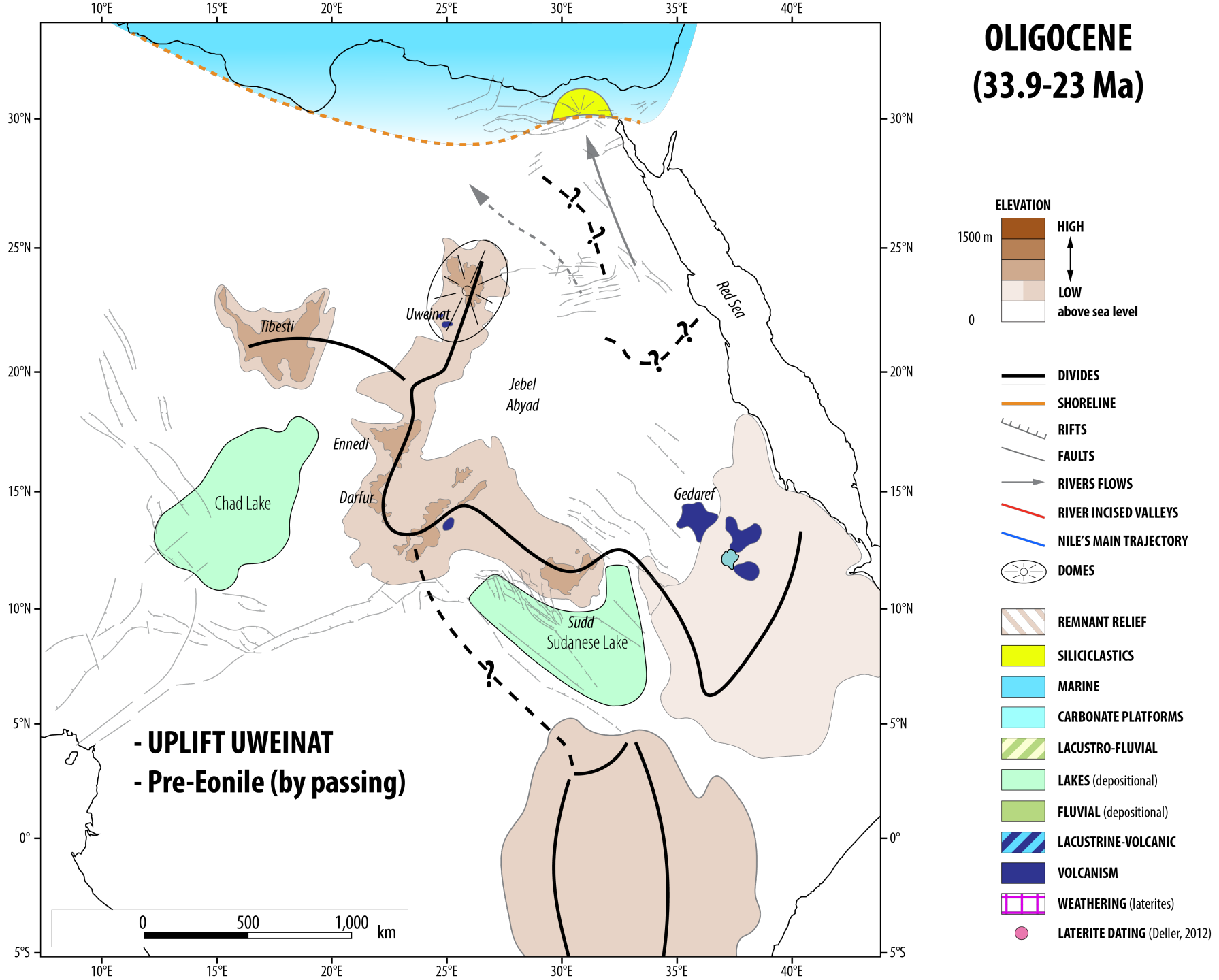


# EOCENE (56-33.9 Ma)



# OLIGOCENE (33.9-23 Ma)

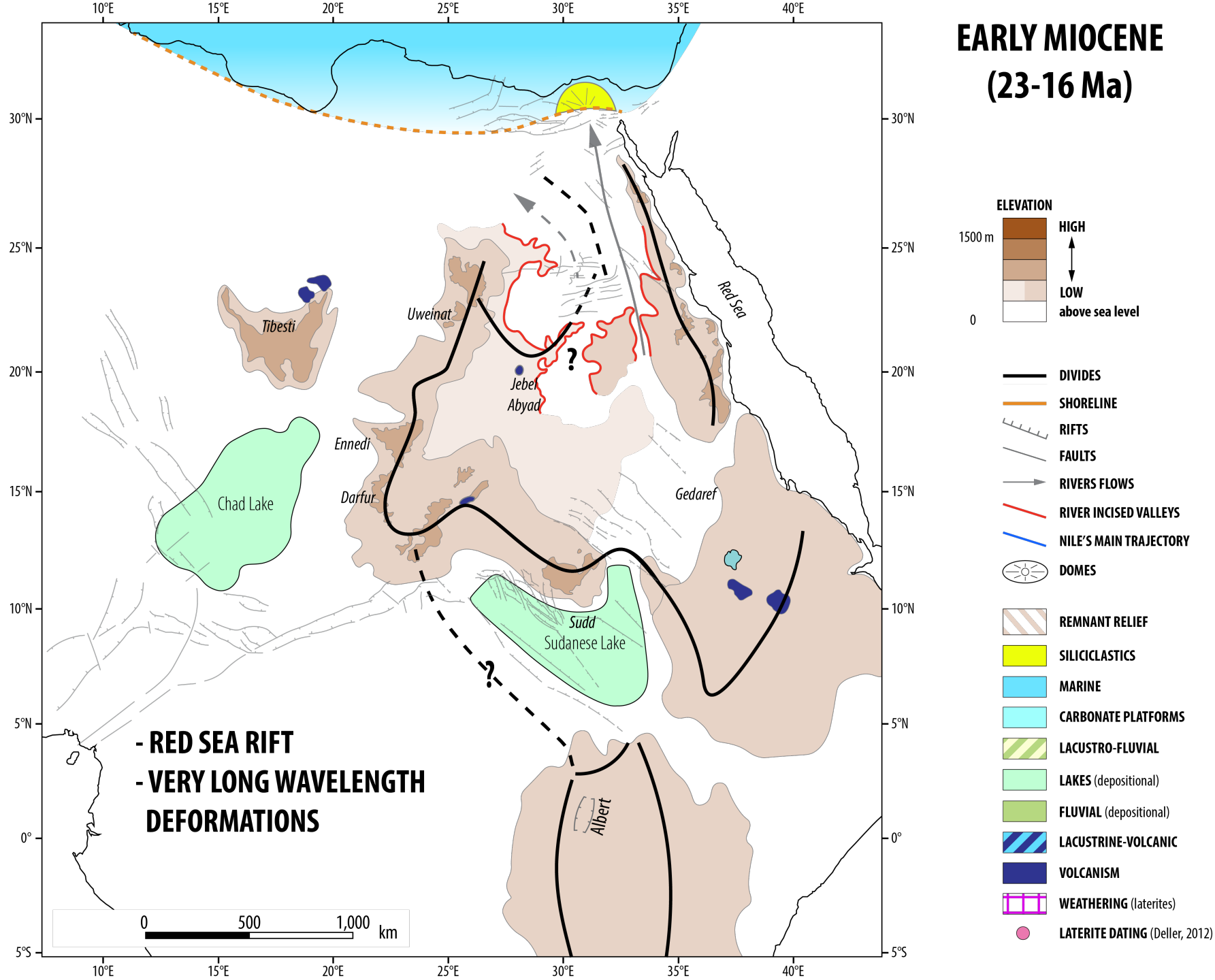
13





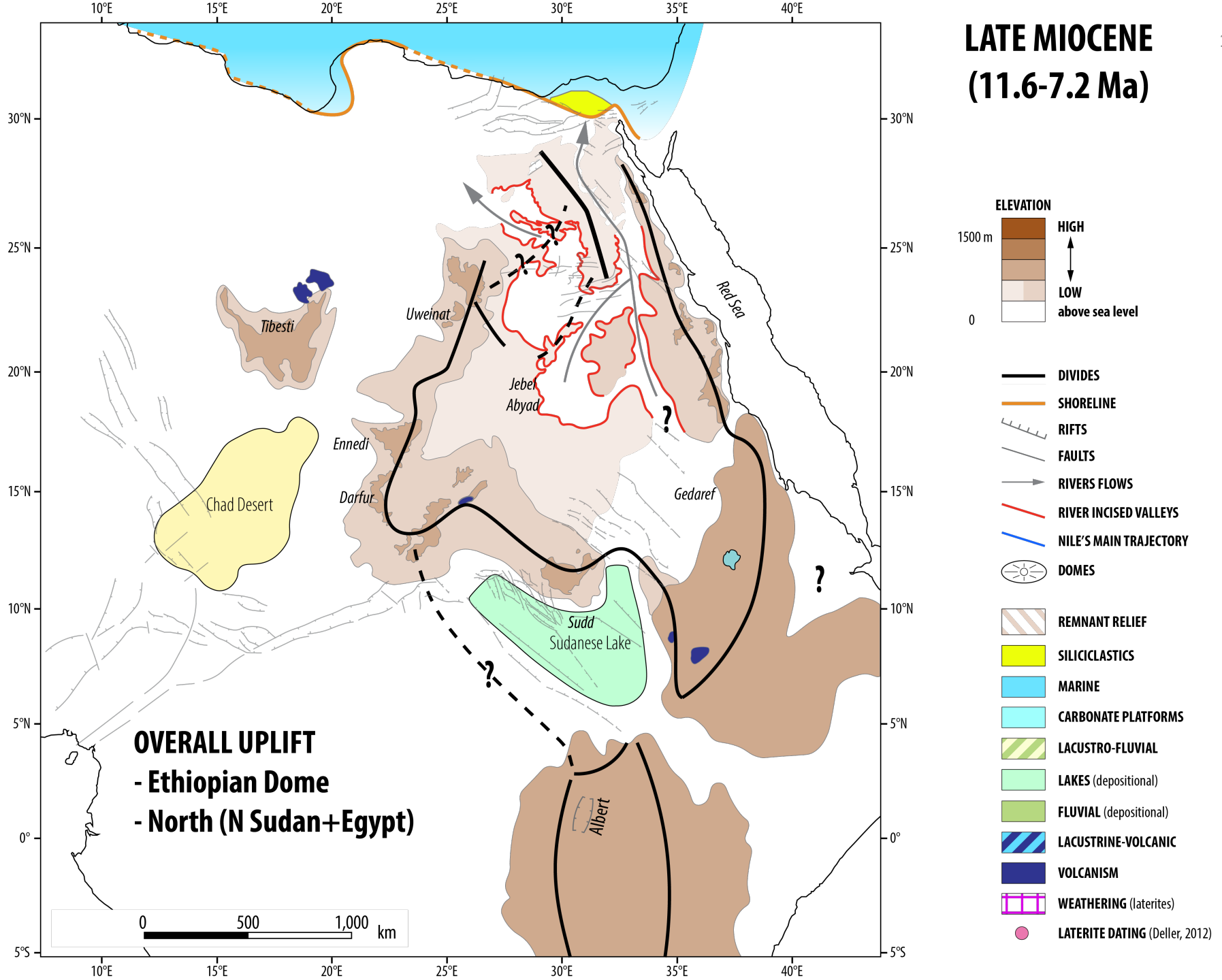
# EARLY MIOCENE (23-16 Ma)

14



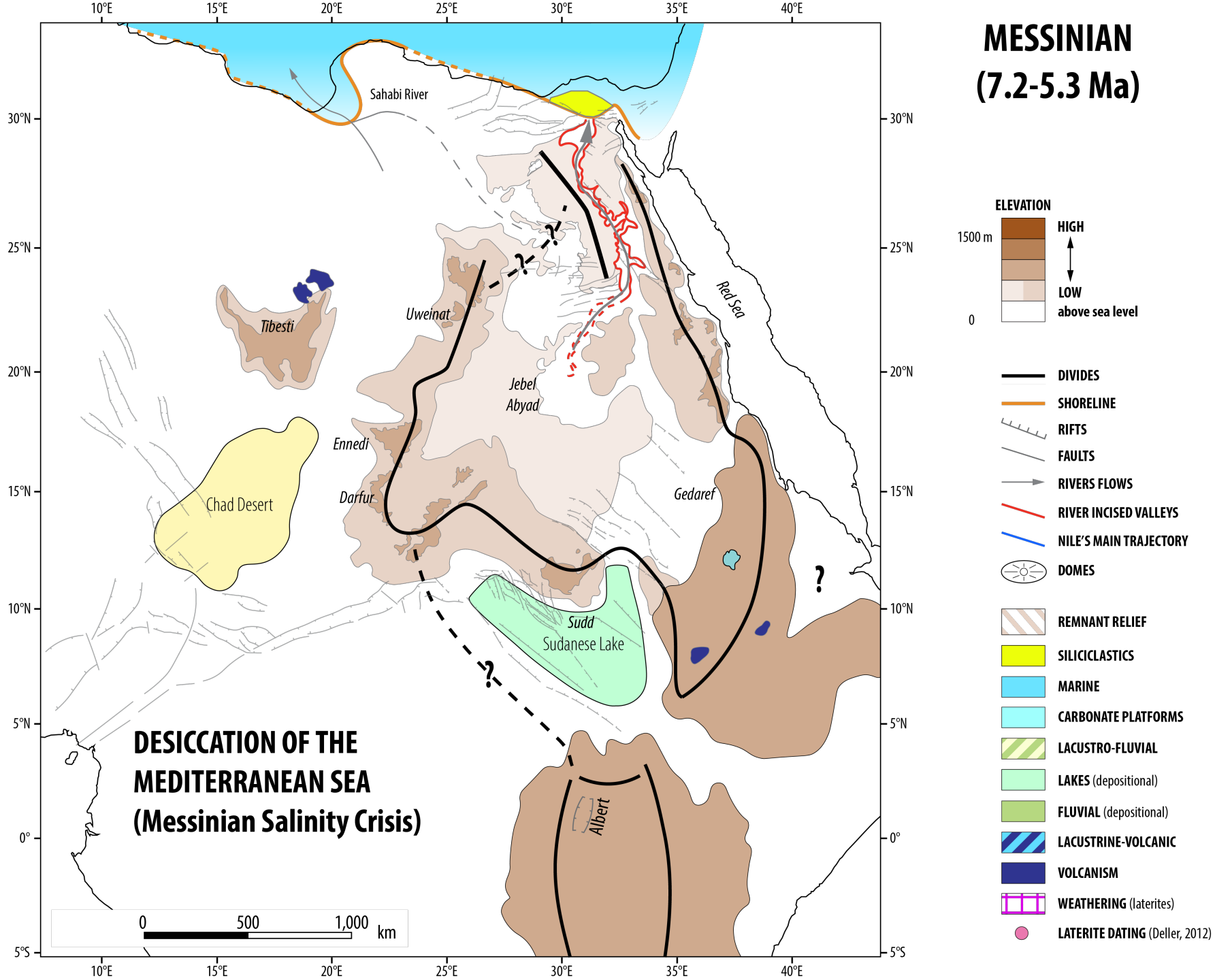
# LATE MIOCENE (11.6-7.2 Ma)

15



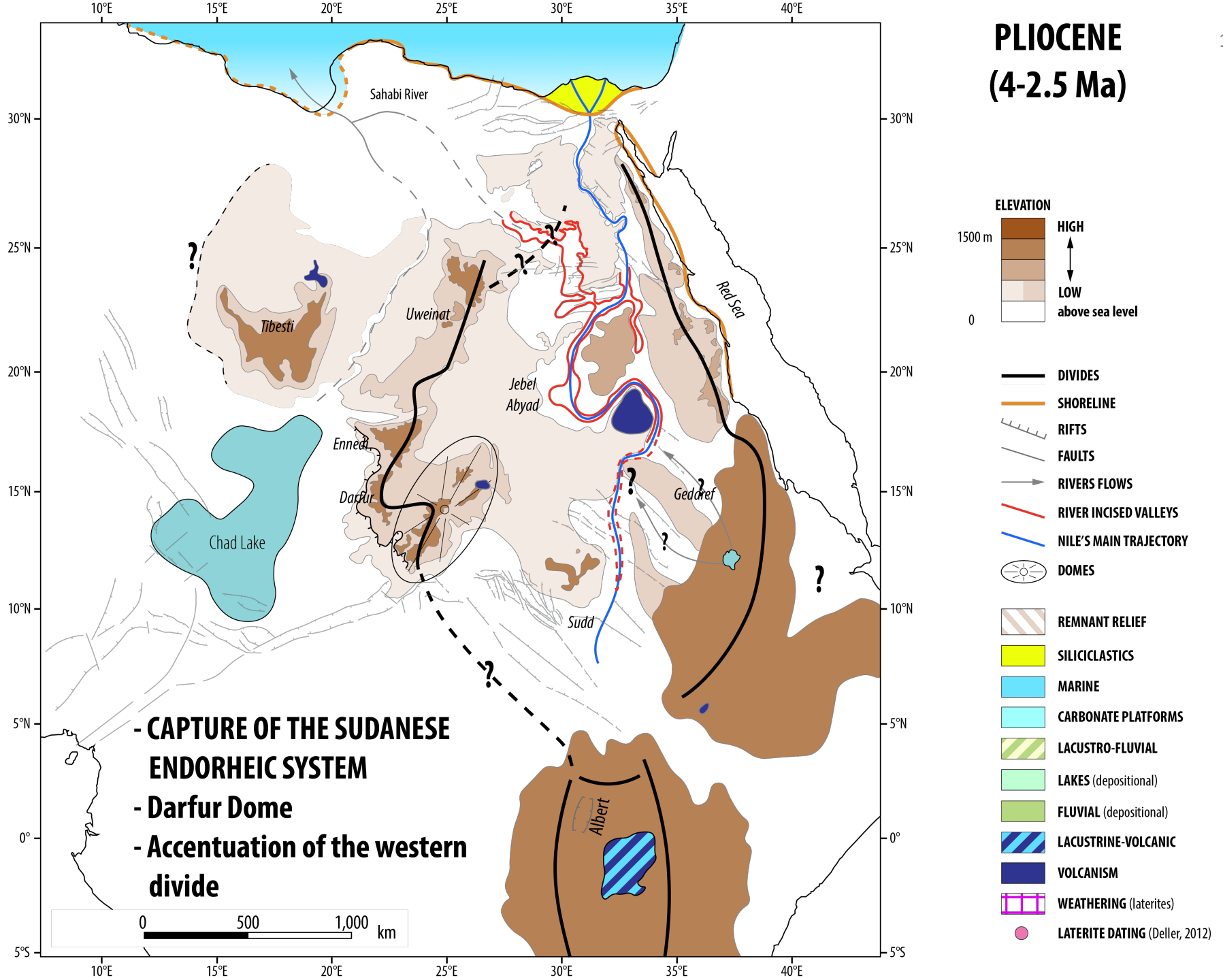


# MESSINIAN (7.2-5.3 Ma)



# PLIOCENE (4-2.5 Ma)

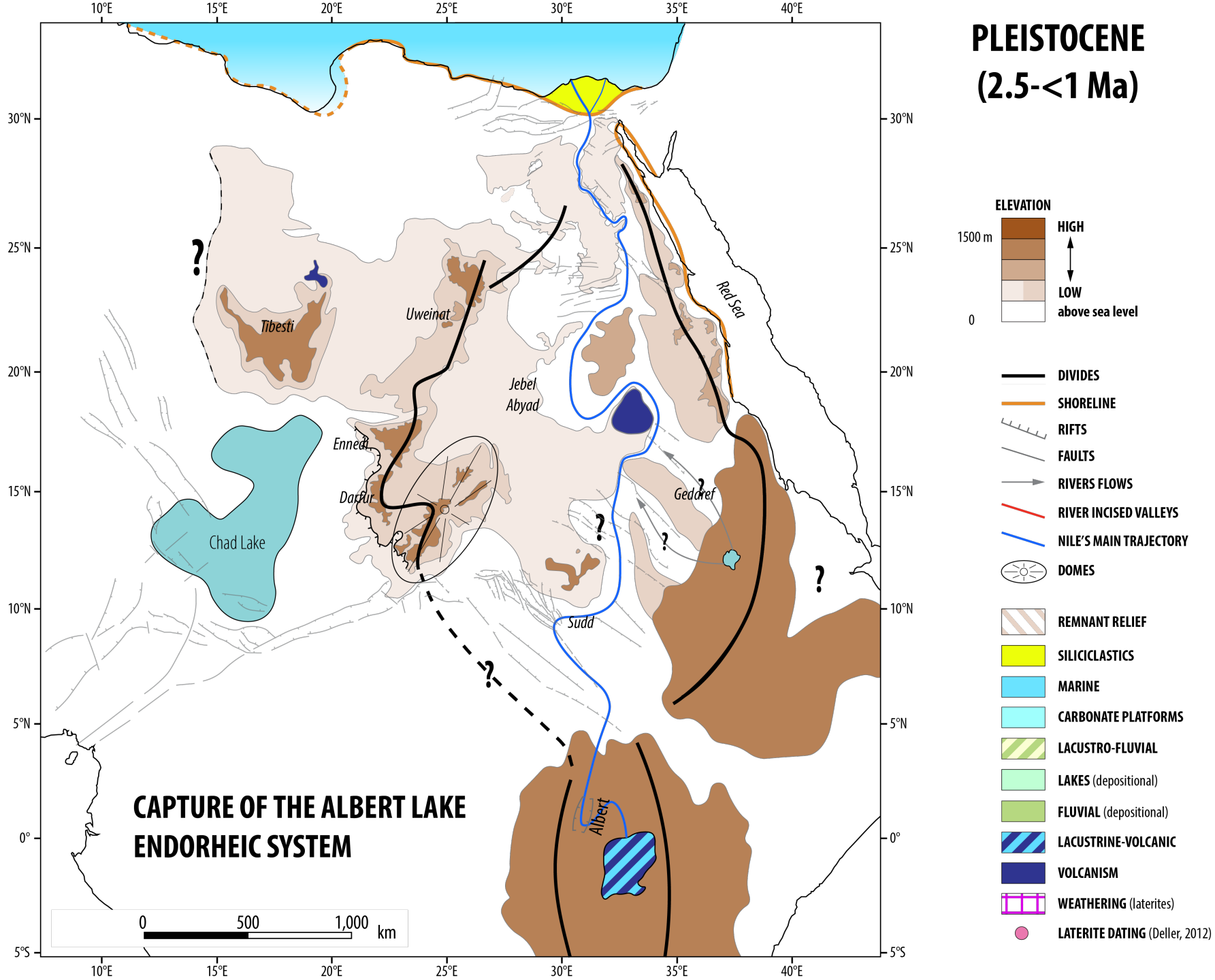
17



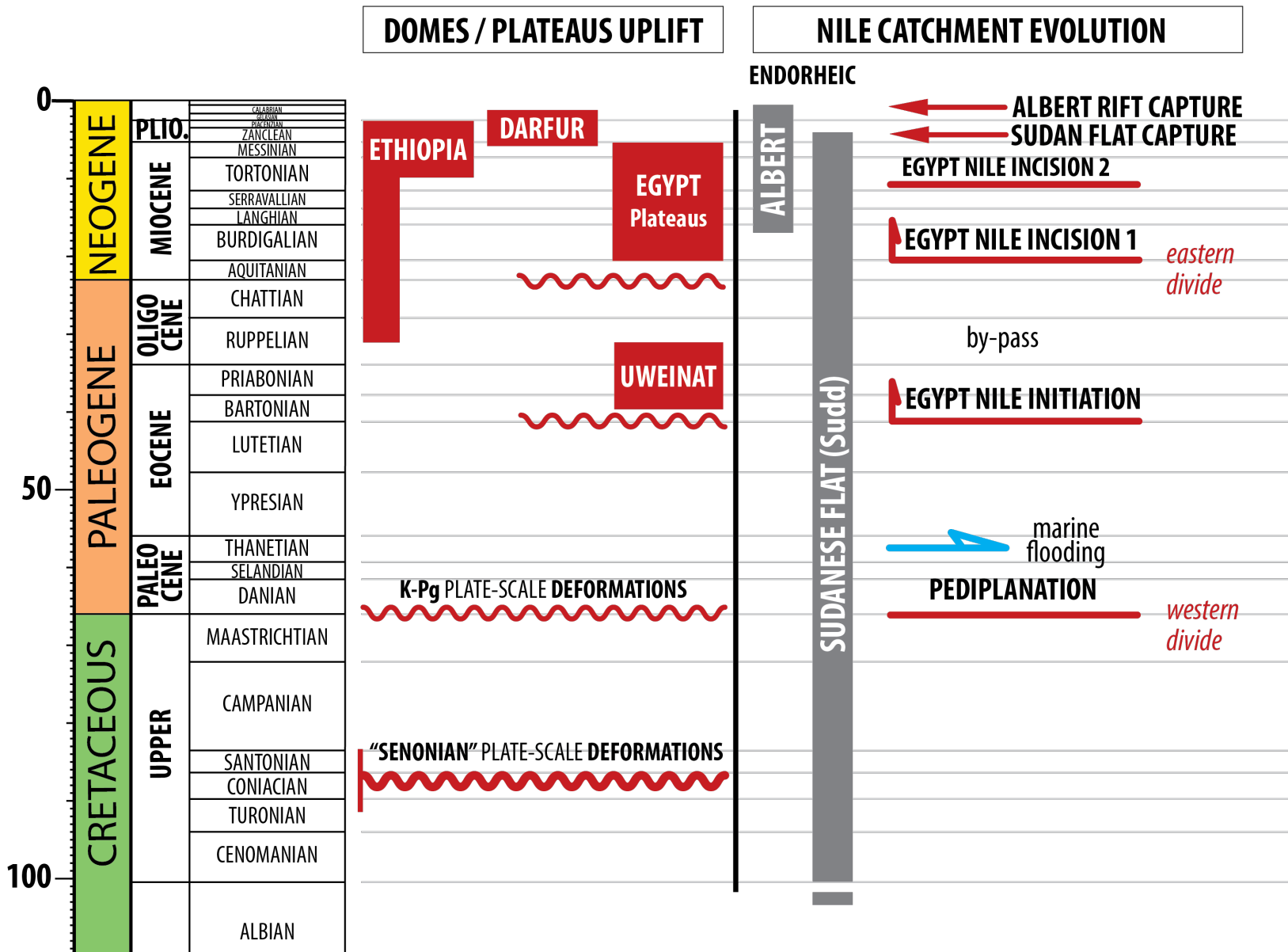


# PLEISTOCENE (2.5-<1 Ma)

18



# NILE SUMMARY CHART





A topographic map of Southeast Asia, showing the Malay Peninsula, Sumatra, and the Indonesian archipelago. The map uses a color gradient to represent elevation, with green for low-lying areas and brown/orange for higher elevations. A yellow horizontal band is overlaid across the center of the map.

# THANK YOU!



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