Semi-3D stratigraphic architecture of a siliciclastic shallow-marine platform: Insights from the Ktawa Group (Late Ordovician), Morocco

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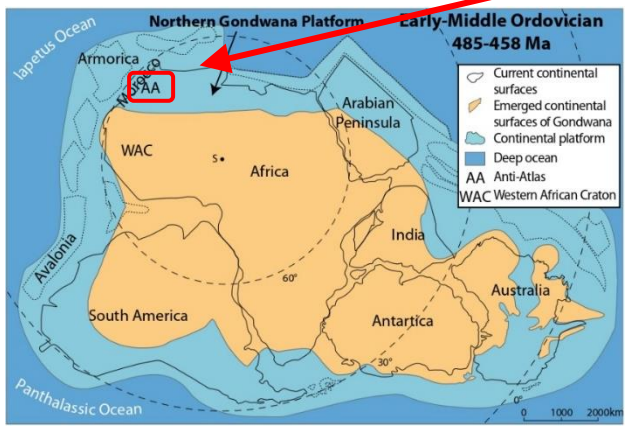
[4]Institut des Dynamiques de la Surface Terrestre, Université de Lausanne
[5] Institut ENSEGID, Université Bordeaux 3

Context, Data and Methods



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Morocco was part of a shallow silicilastic marine platform, on the northern margin of the supercontinent Gondwana. The studied region is located in the Anti-Atlas.

Context, Data and Methods

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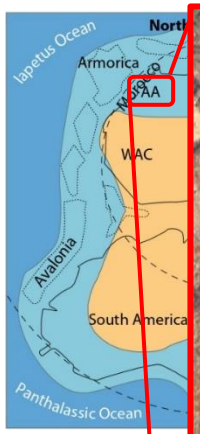

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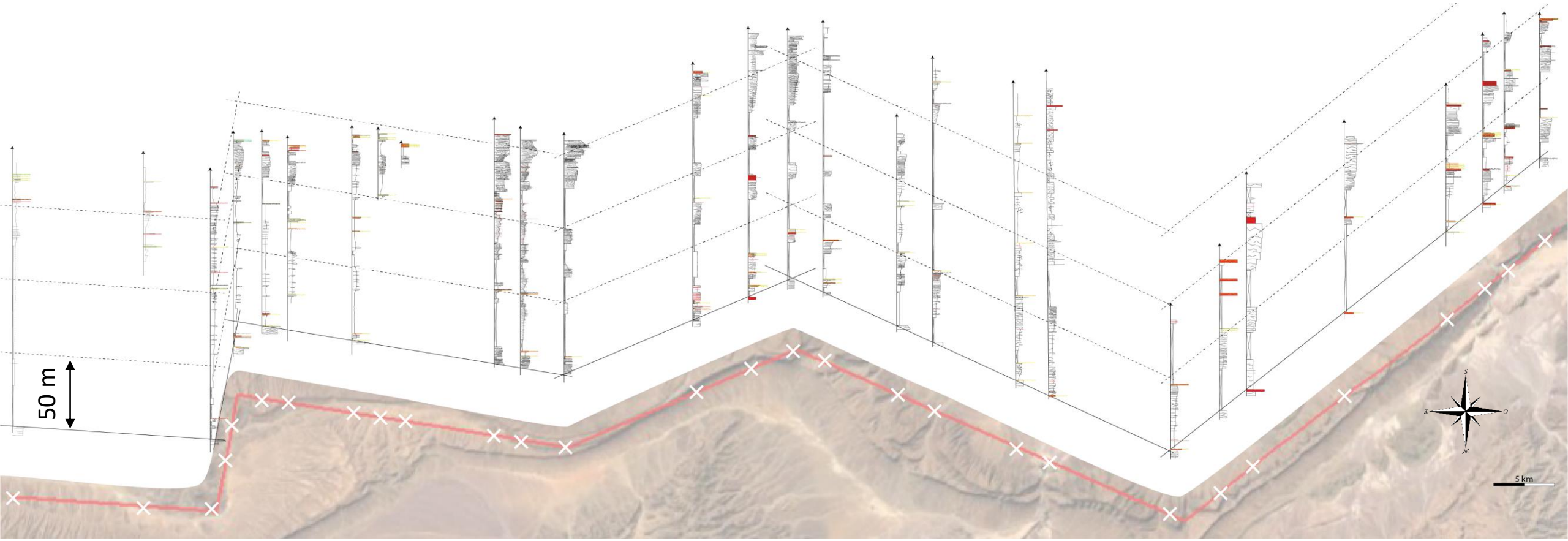
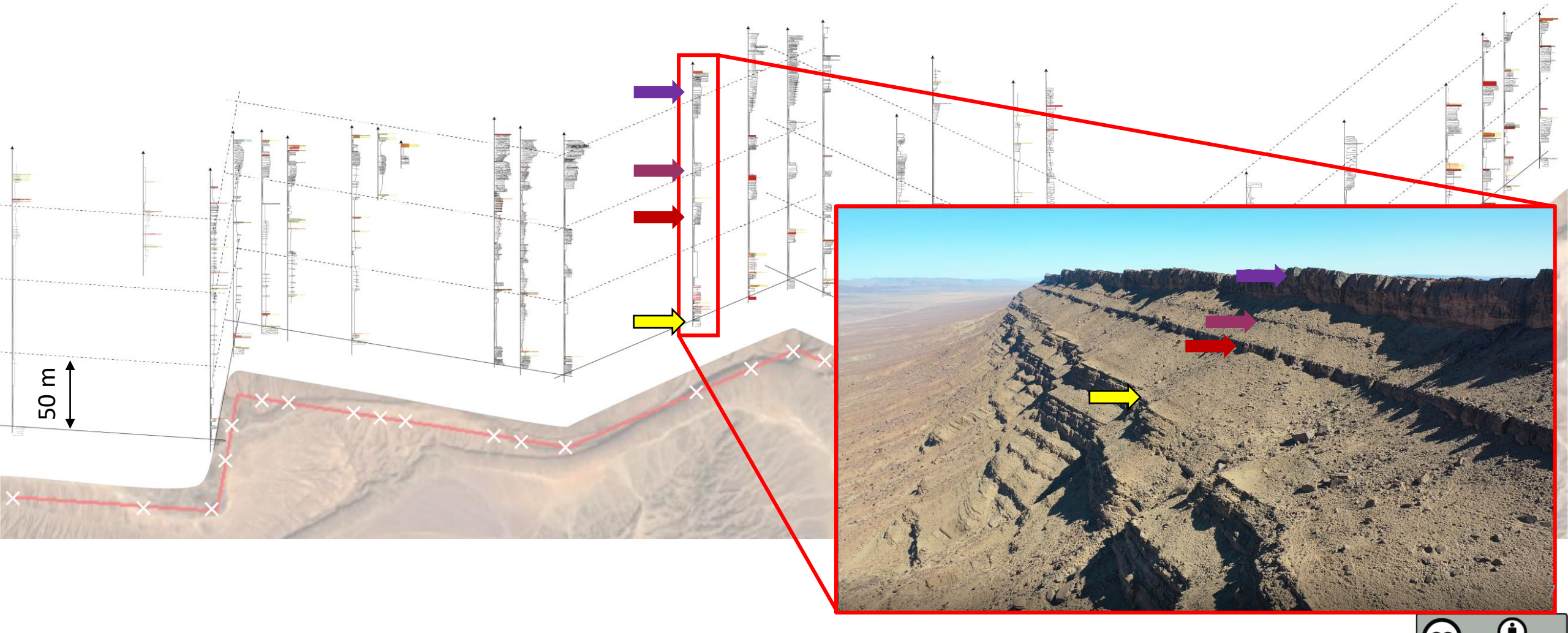
Survey of 42 stratigraphic logs on a ca. 175 km long transect.
Focus is put on the Lower Ktawa Formation, which are preglacial sediments of Late Ordovician in age.

Transect overview with selected logs



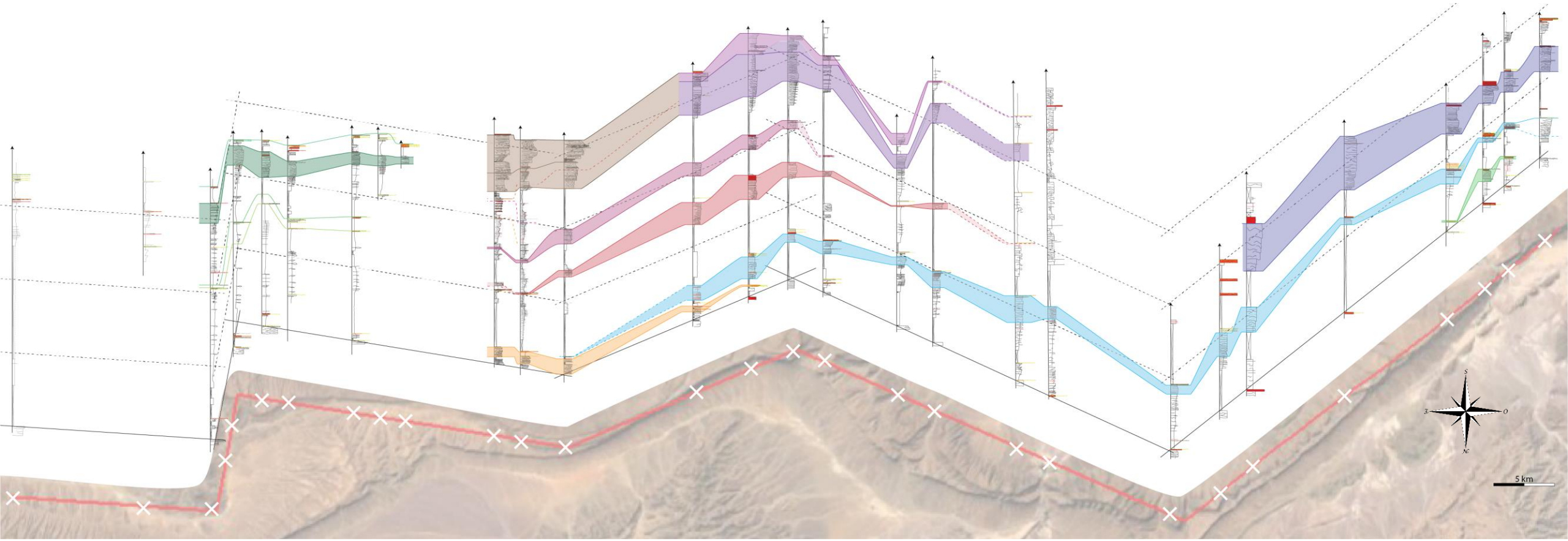
Transect overview with selected logs

Sand cuestas oustand from a shally background, that are interpreted as lowtands.



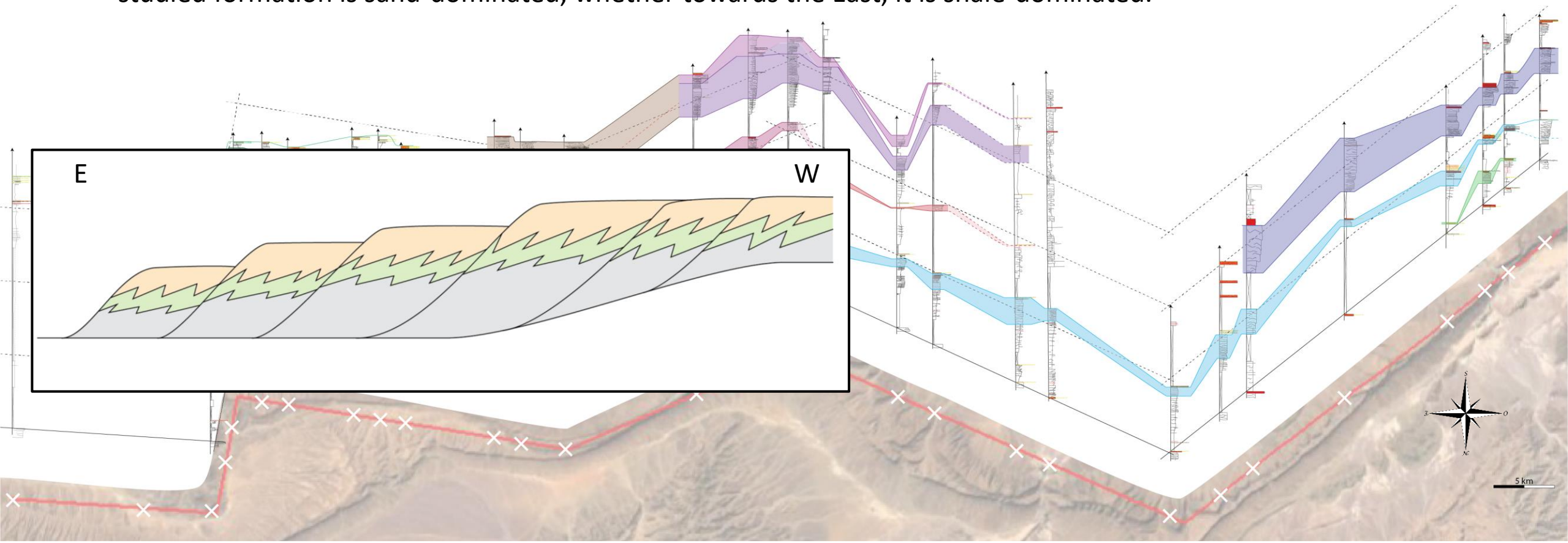
Transect overview with selected logs

What is the proximal-to-distal trend of this Formation?



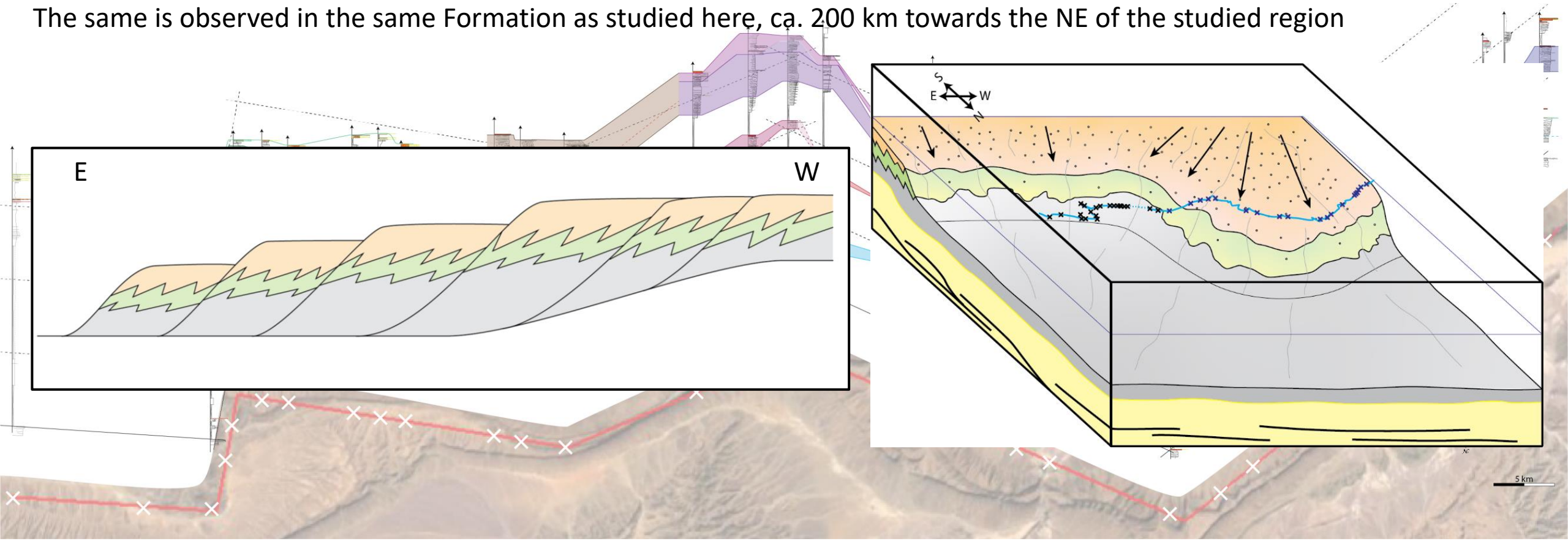
Transect overview with selected logs

Community agreement on the **West to East trend**. Western of the studied region, the studied formation is sand-dominated, whether towards the East, it is shale-dominated.



Transect overview with selected logs

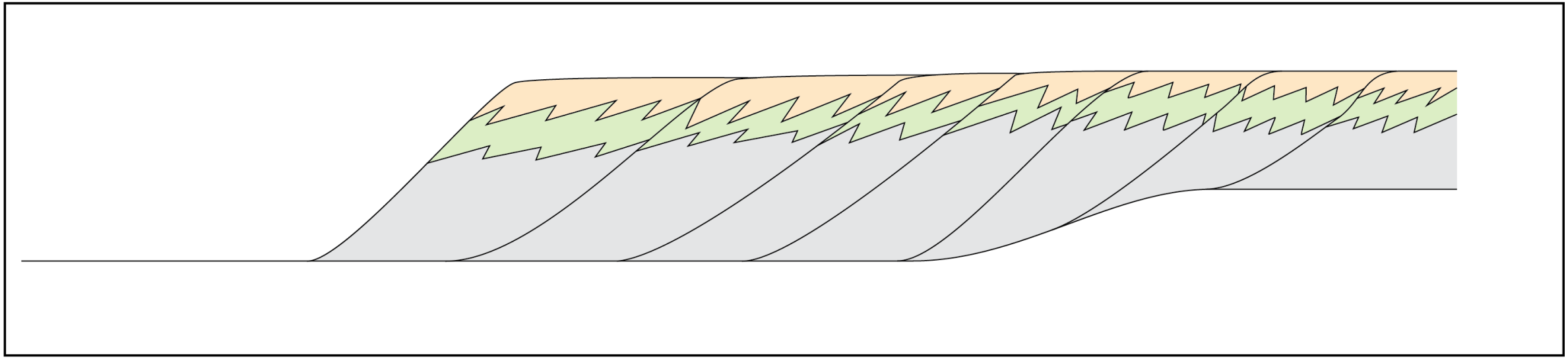
Or is it South-to-North oriented?
The flatness of the cuestas and the different orientations of the transects allow us to interpret the data as a South-to-North trend. Moreover, the underlying formation display South-to-North clinoforms progradation.
The same is observed in the same Formation as studied here, ca. 200 km towards the NE of the studied region



General stratigraphic model

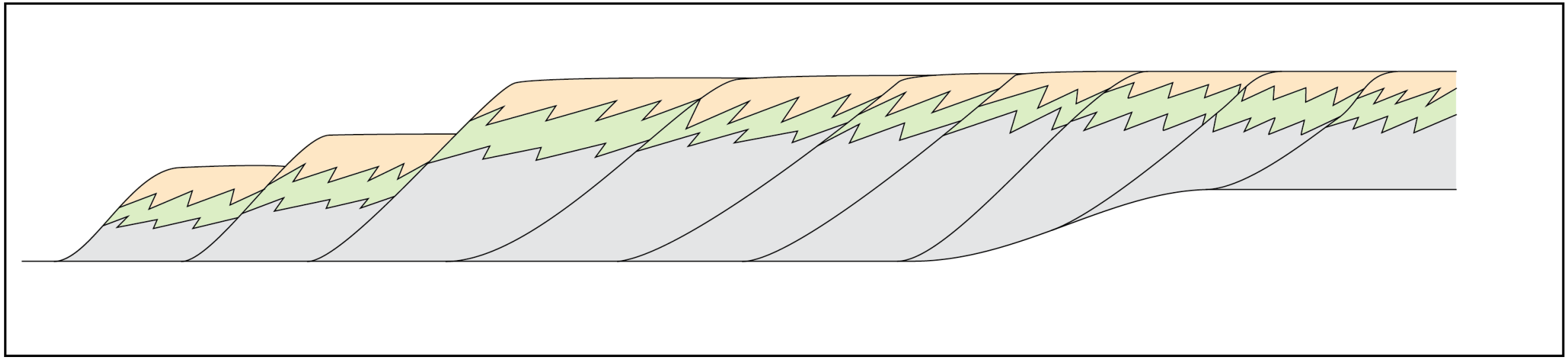
Most of the sand cuestas exhibit the same architectural pattern that allowed us to reconstruct a simple stratigraphic model.

Clinothems progradation with bioturbated sandstones at their top, and shales at their base



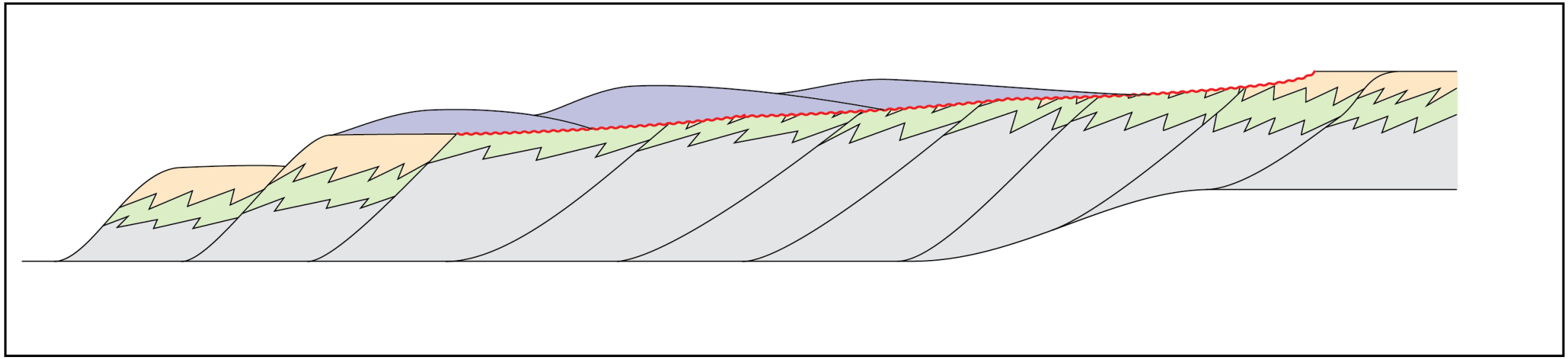
General stratigraphic model

Followed by a degradation of the same facies associations



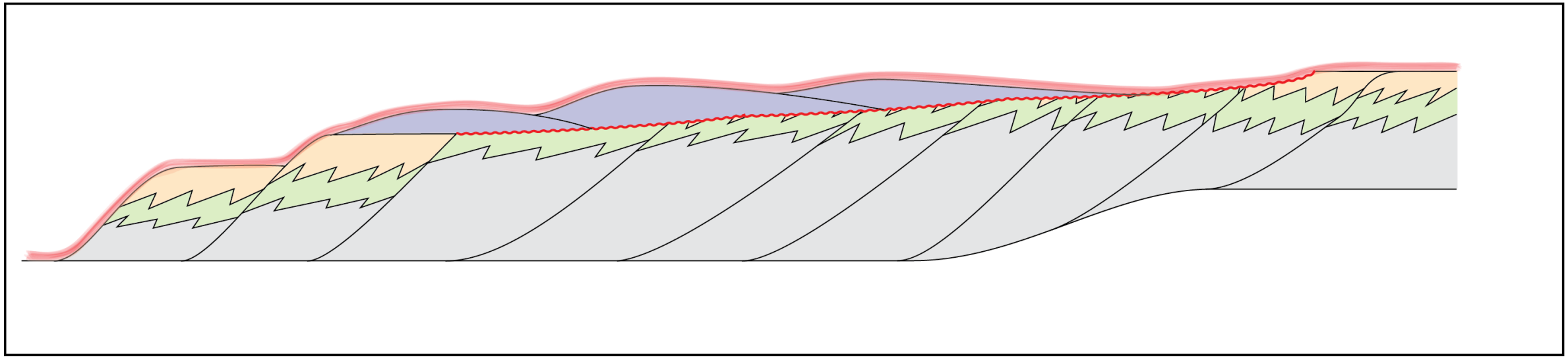
General stratigraphic model

Truncated by a transgressive ravinement during the early transgression that is going to rework the previous deposits sediments. Deposition of the rework sediments as high-energy storm deposits.



General stratigraphic model

Ongoing of the trangression. Formation of a condensed ferrugineous level and deposition of shales above it.



West-East proximal-to-distal trend?

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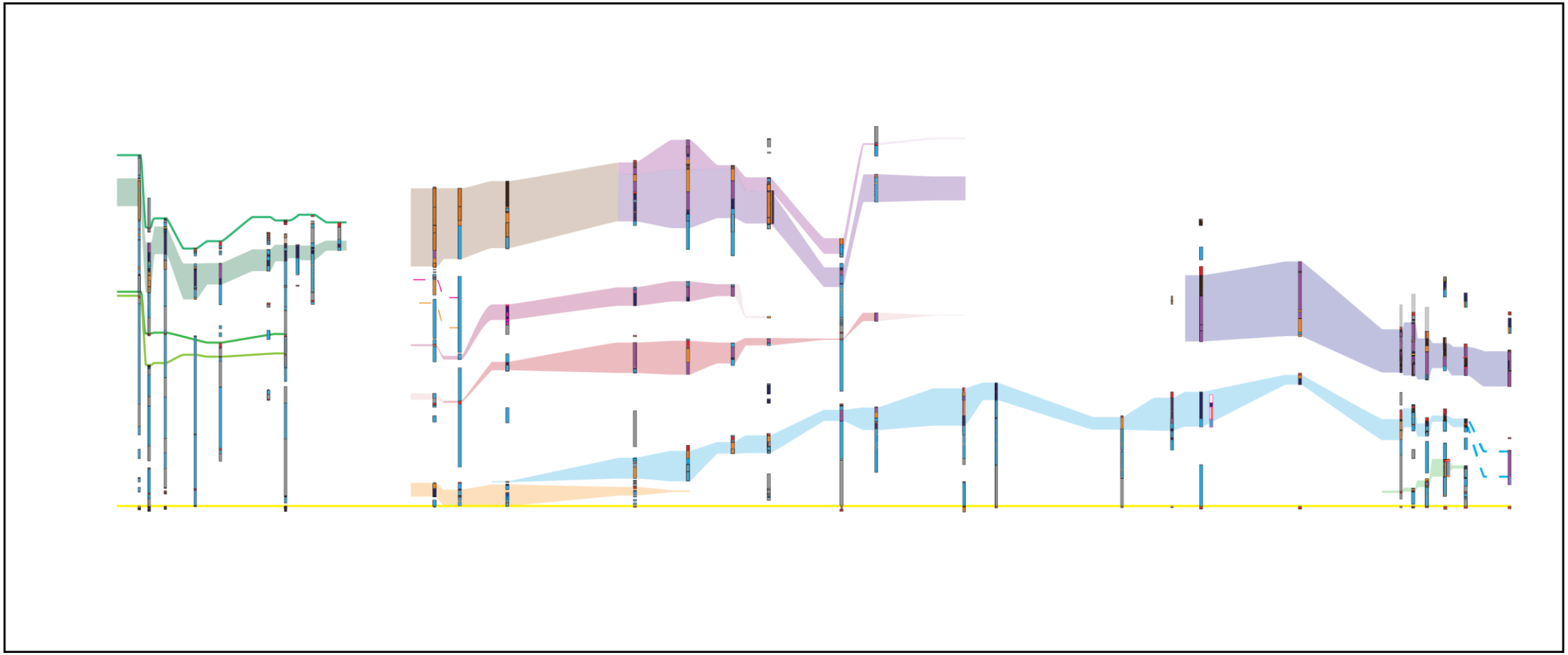
E



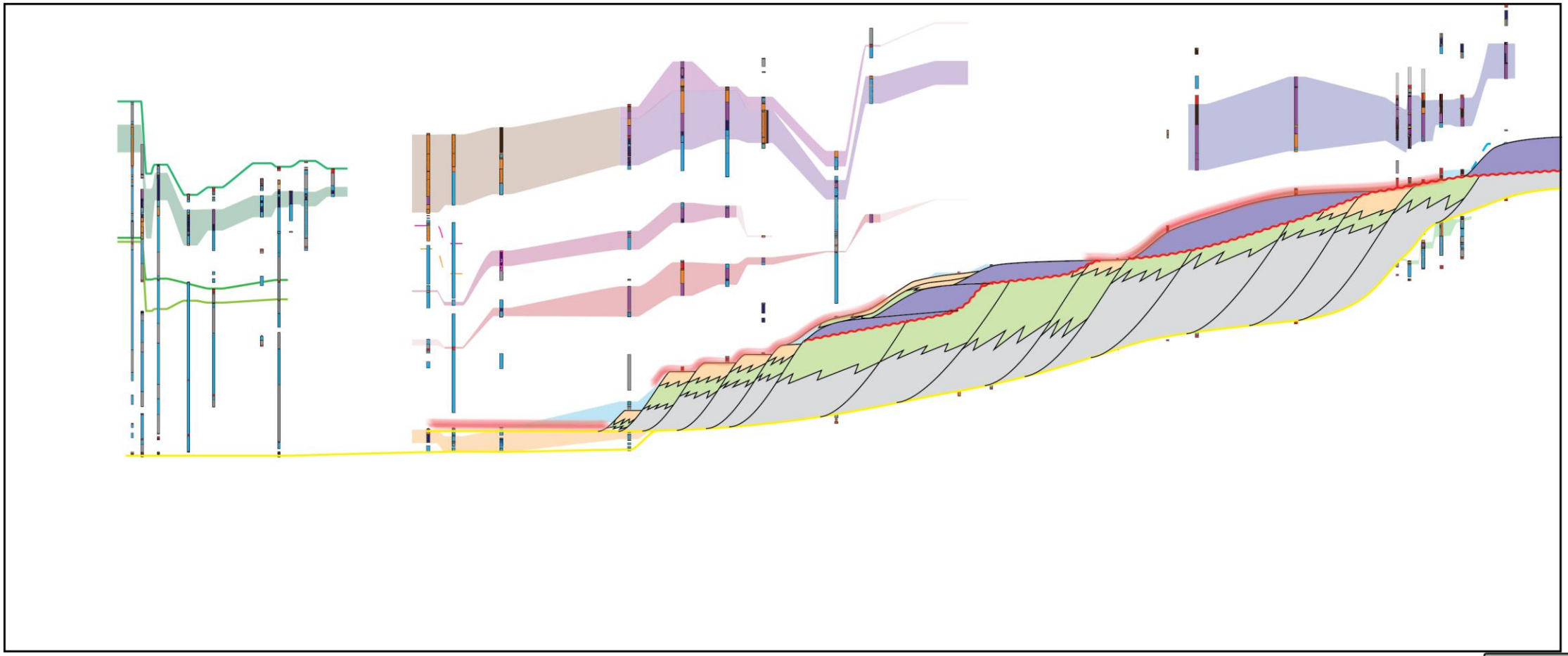
W

West-East proximal-to-distal trend?

E

Complex history. Implies at least 2 progradation/degradation/retrogradation cycles.
Requires **differential subsidence**. Although, the stratigraphic models works.

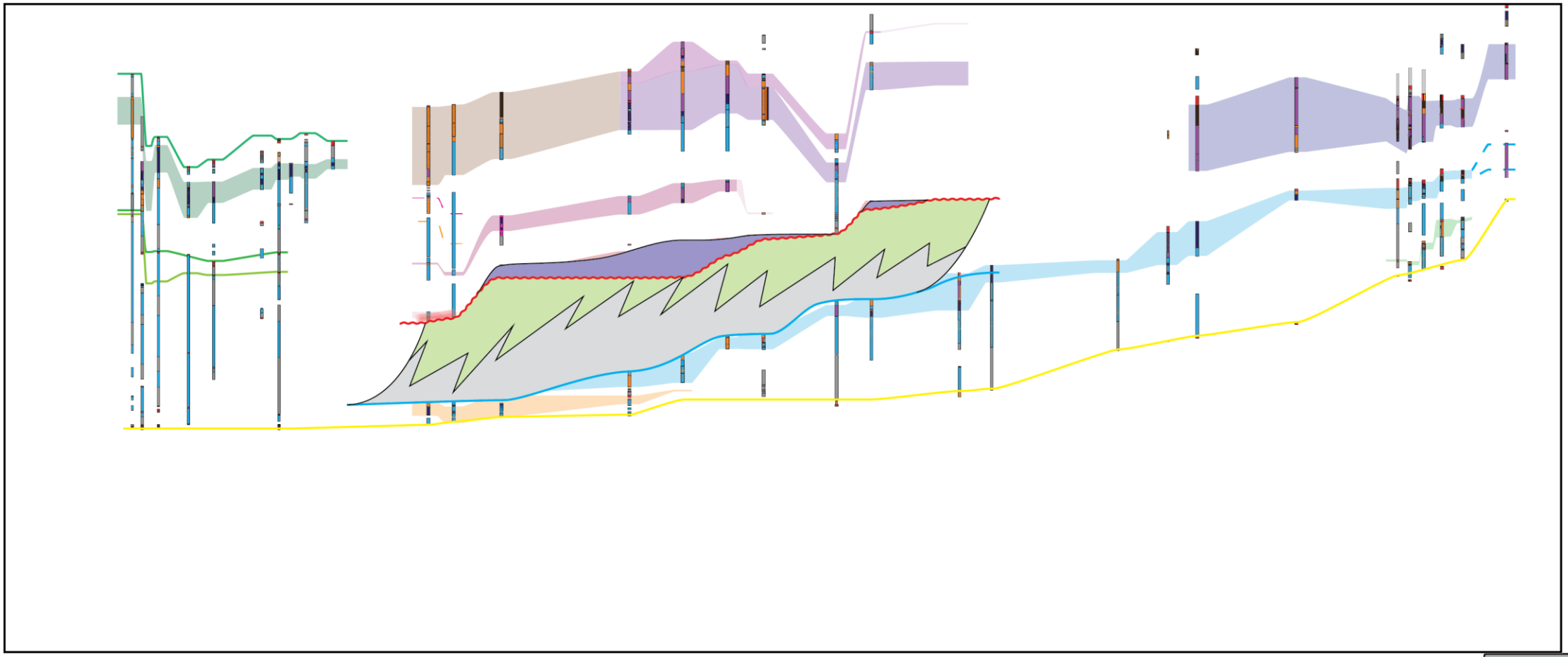
W



West-East proximal-to-distal trend?

Shift of the subsidence towards the East.

E W



West-East proximal-to-distal trend?

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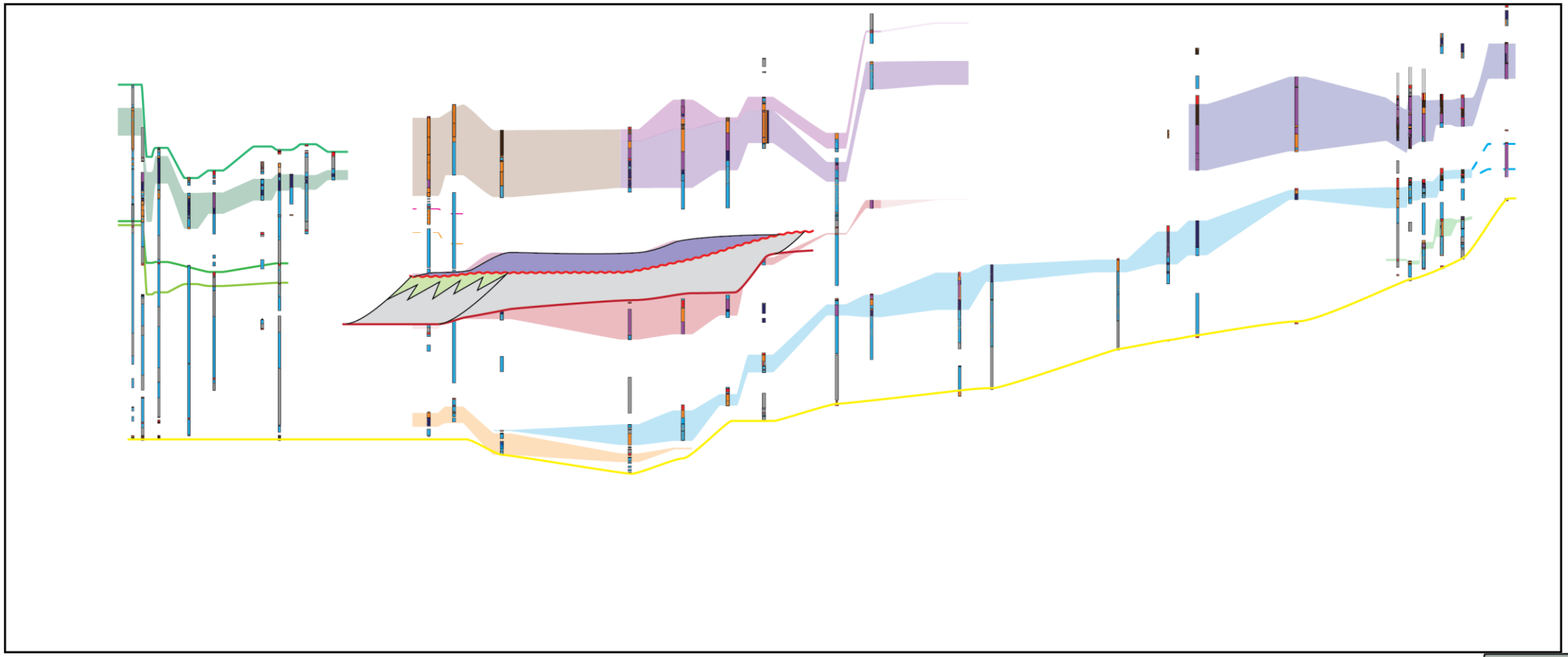
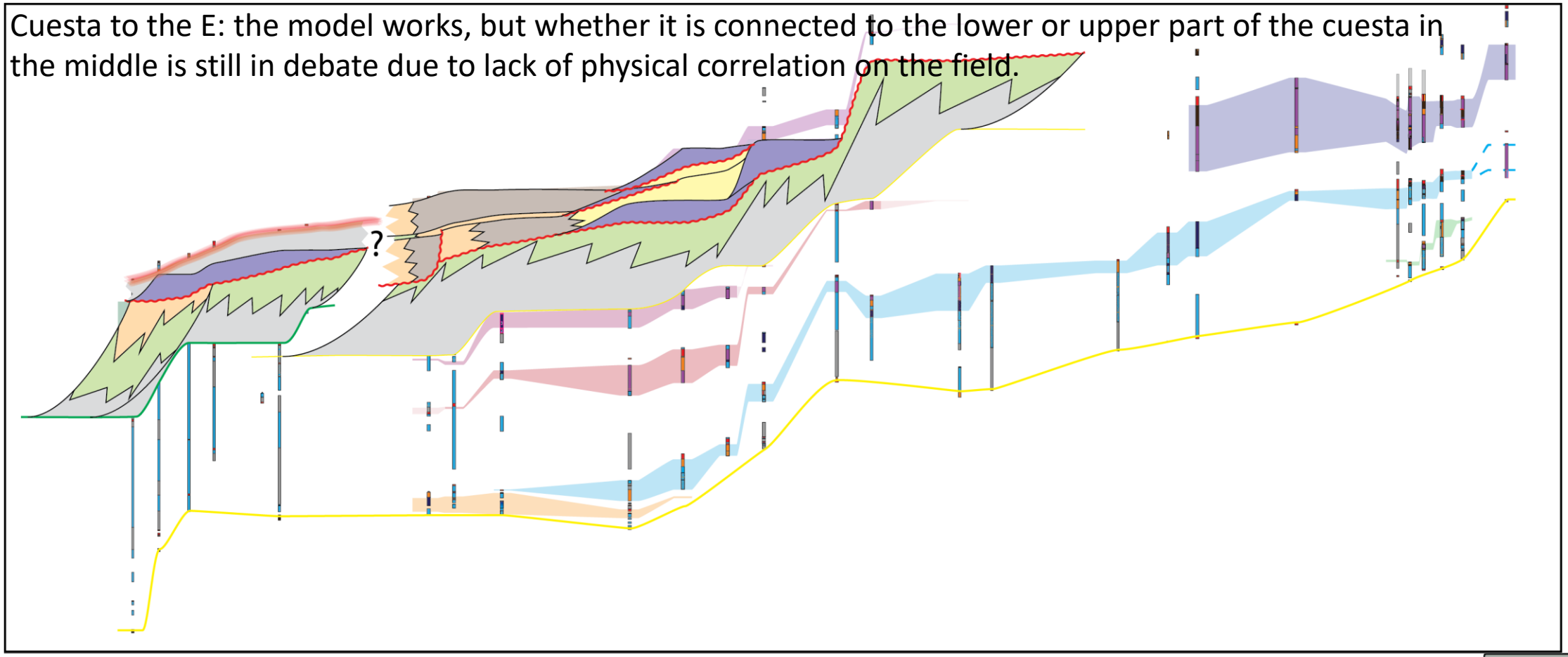


West-East proximal-to-distal trend?

E

Cuesta in the center: complex history. Implies several subcycles and a composite architecture with consequent hiatuses or eroded zones.

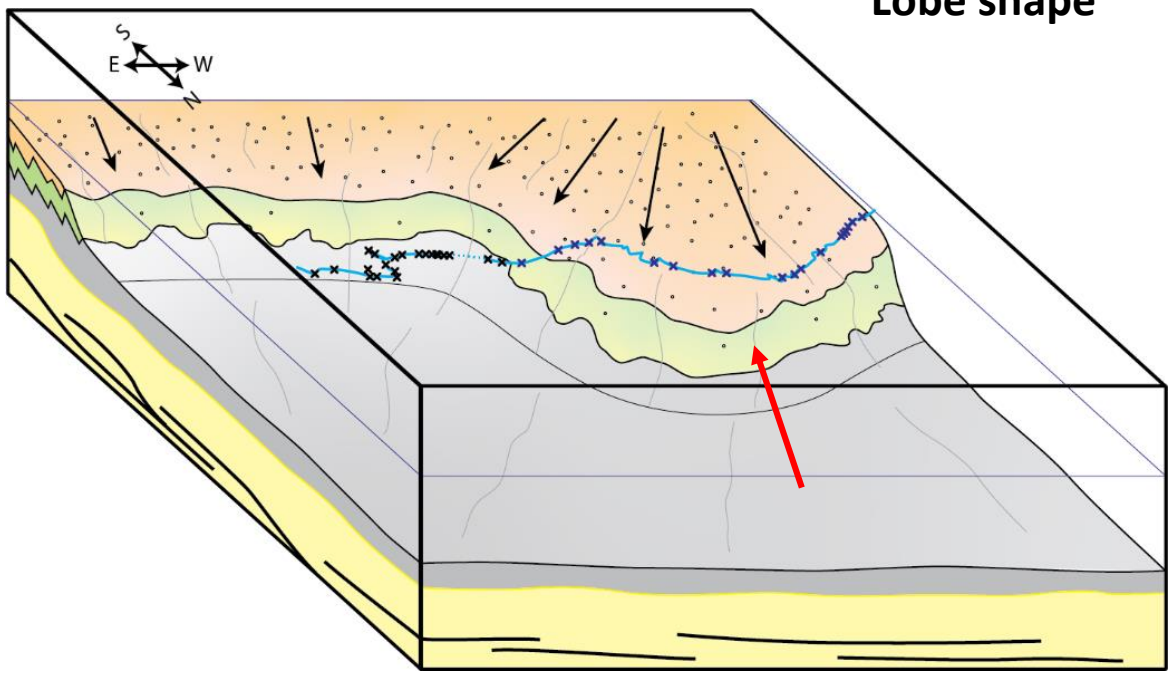
W

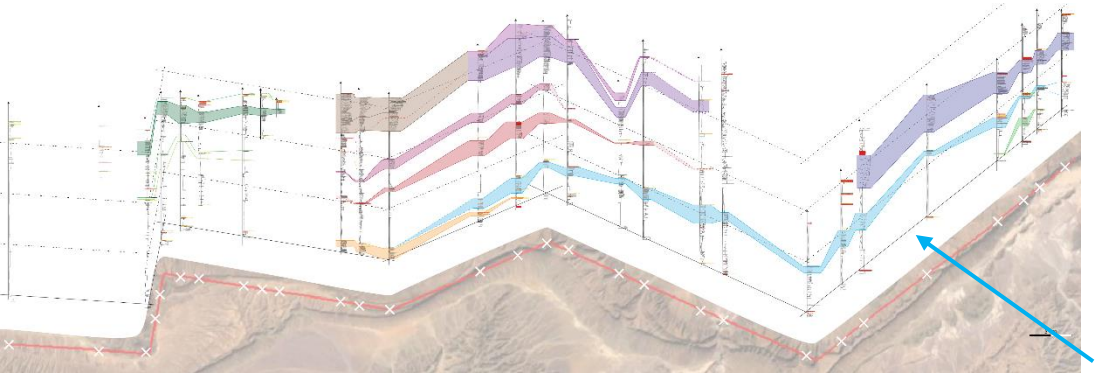


Or South-North oriented?

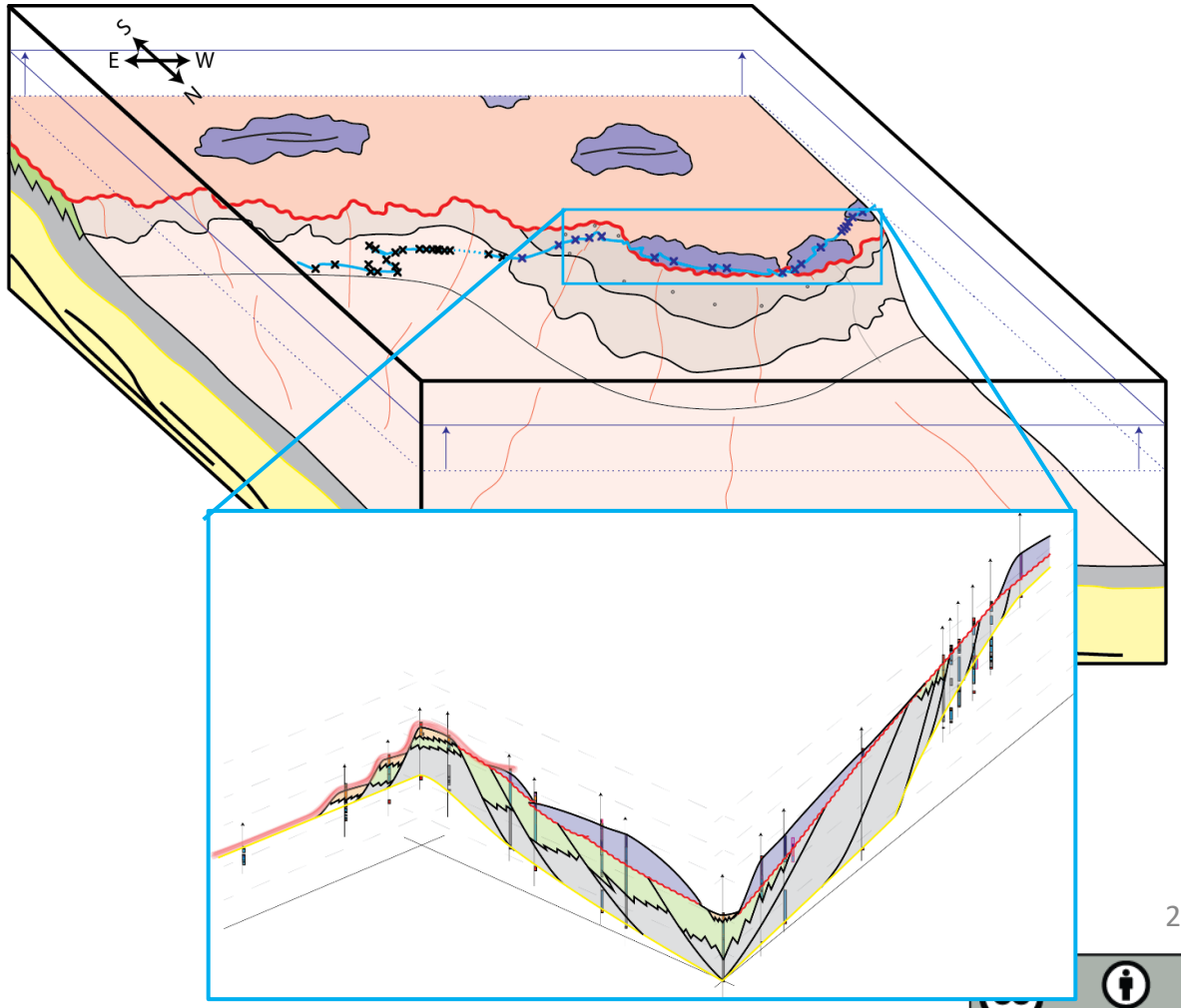
Regression

Lobe shape





Transgression



Or South-North oriented?

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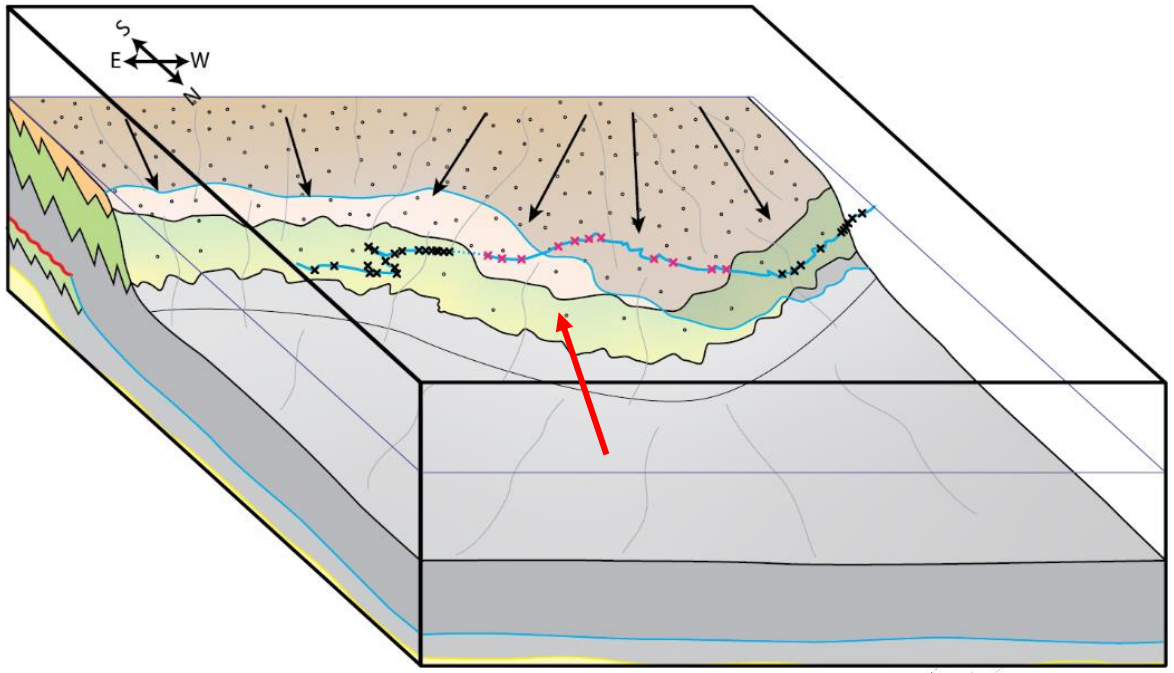
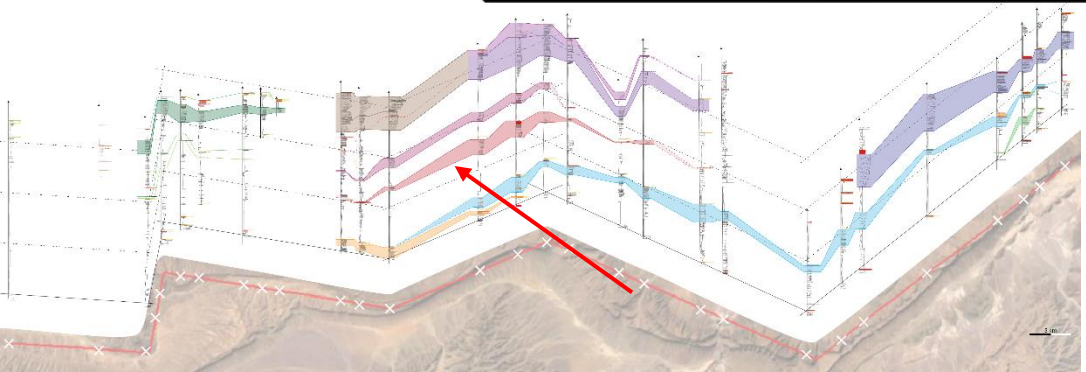
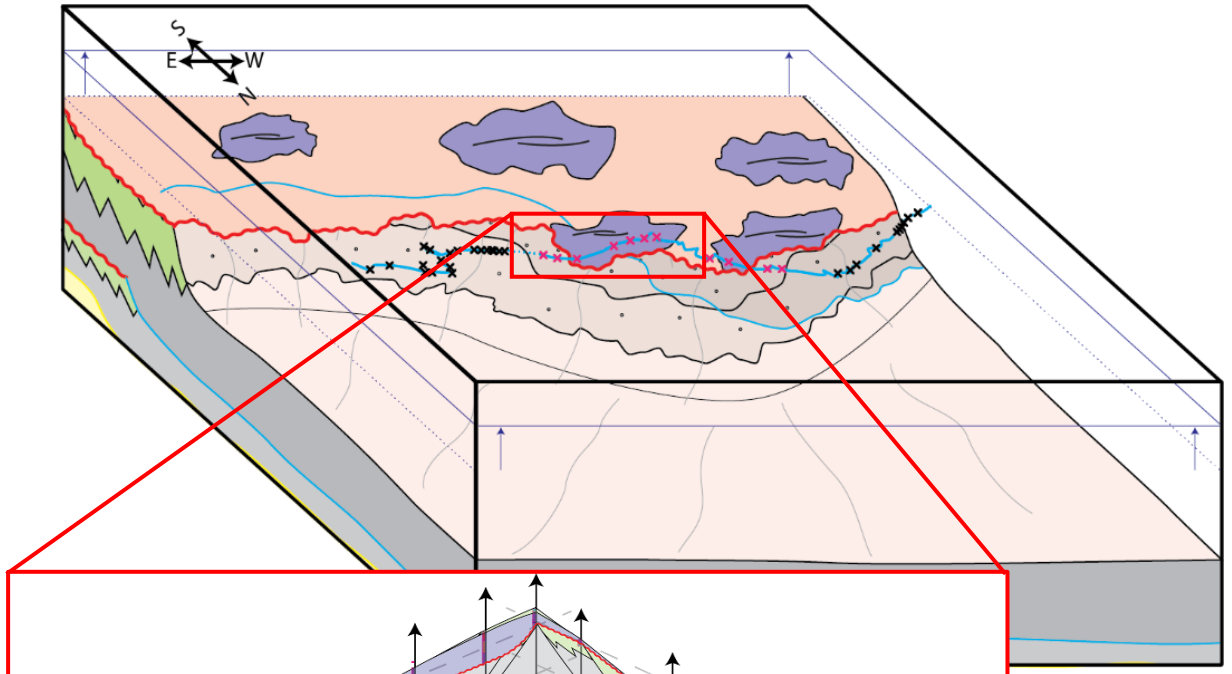
Regression

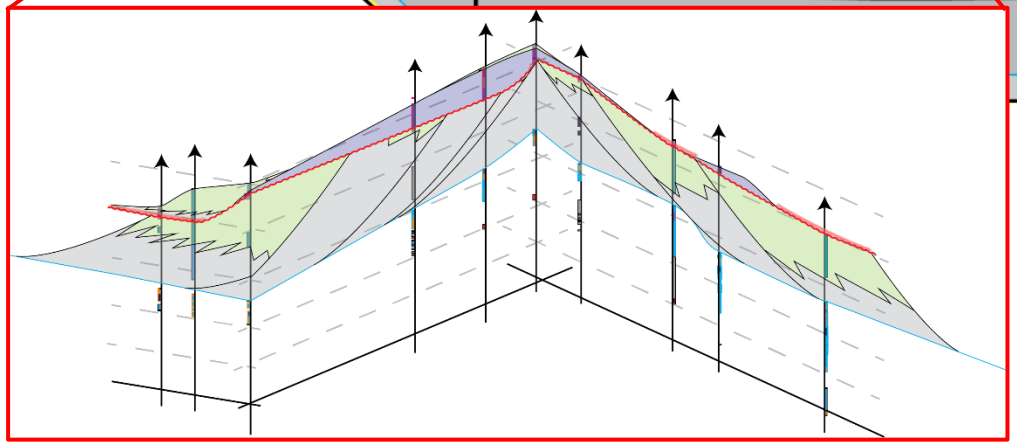
Shift of the lobe shape towards the E

Transgression







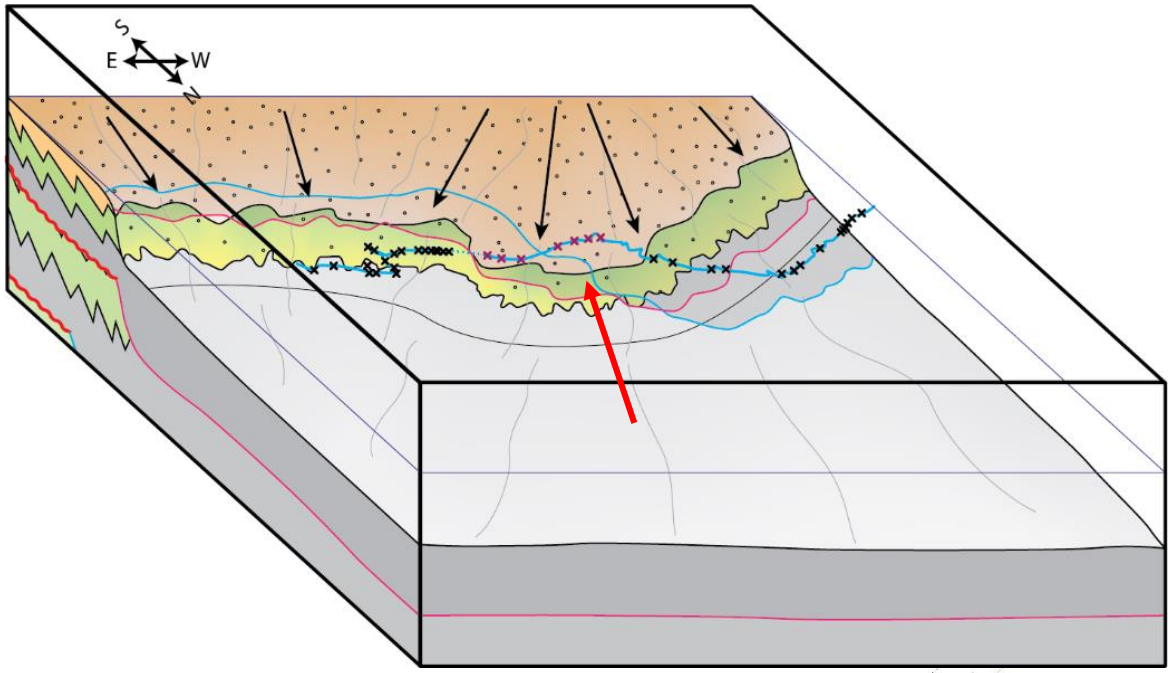


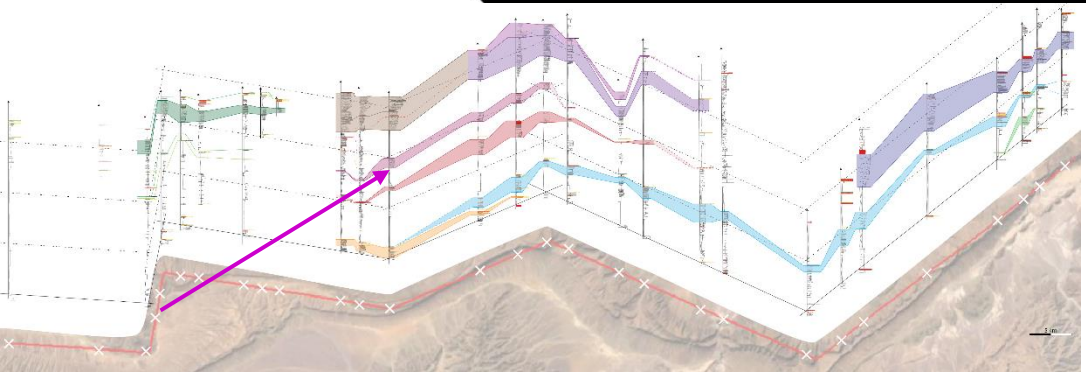
Or South-North oriented?

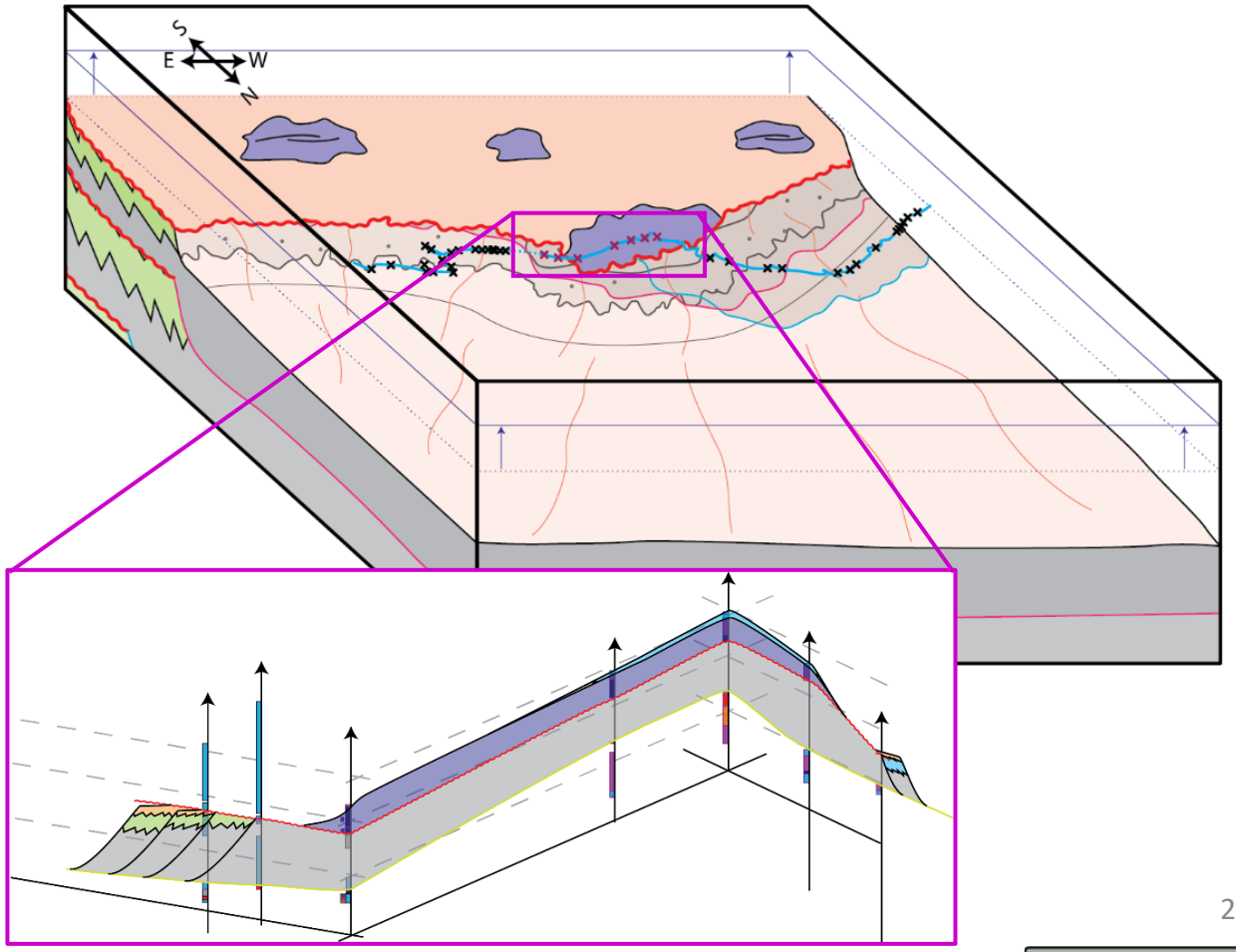
Regression

Shift of the lobe shape towards the E

Transgression







Or South-North oriented?

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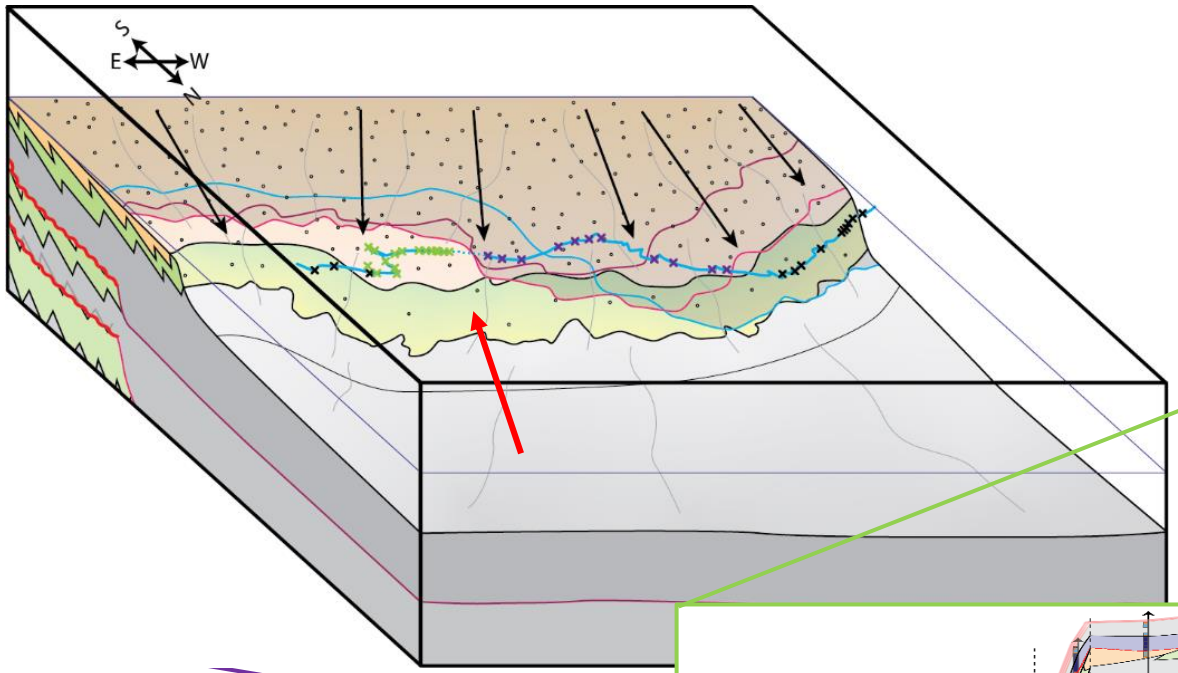
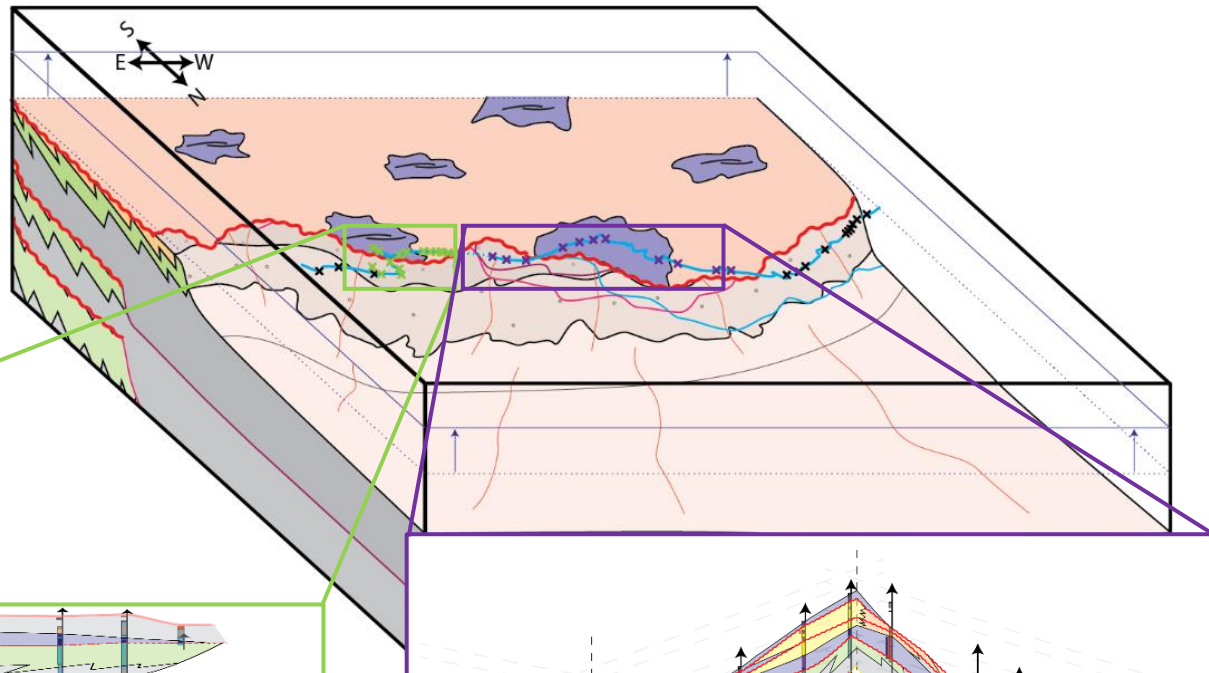
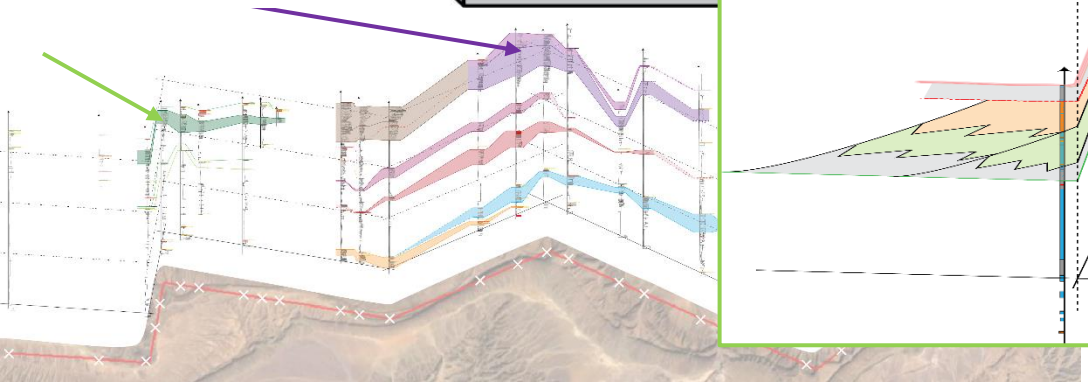
Regression

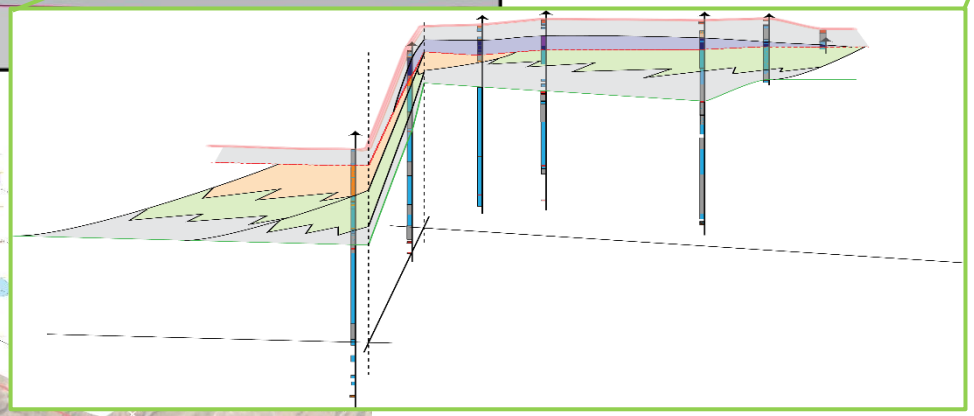
Shift of the lobe shape towards the E

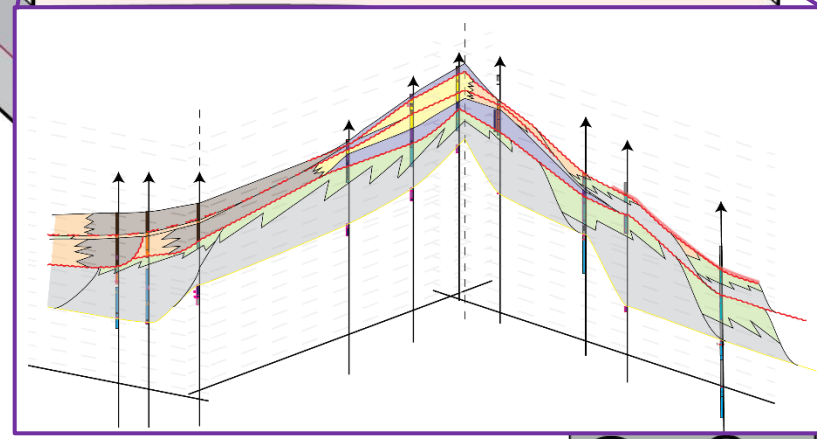
Transgression







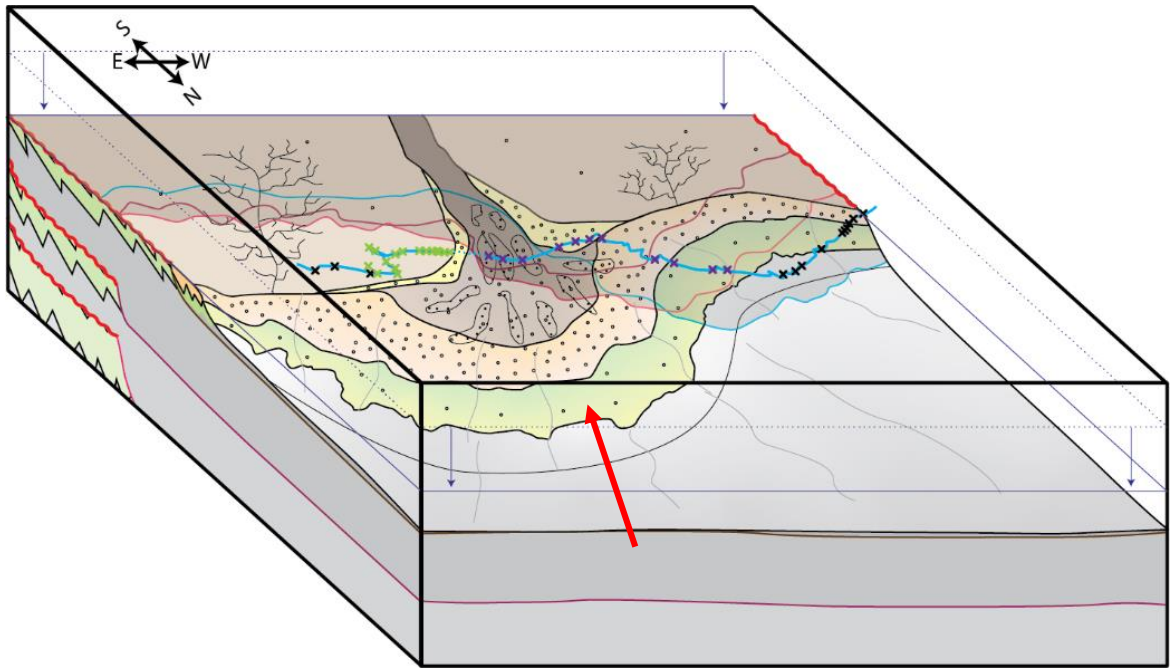


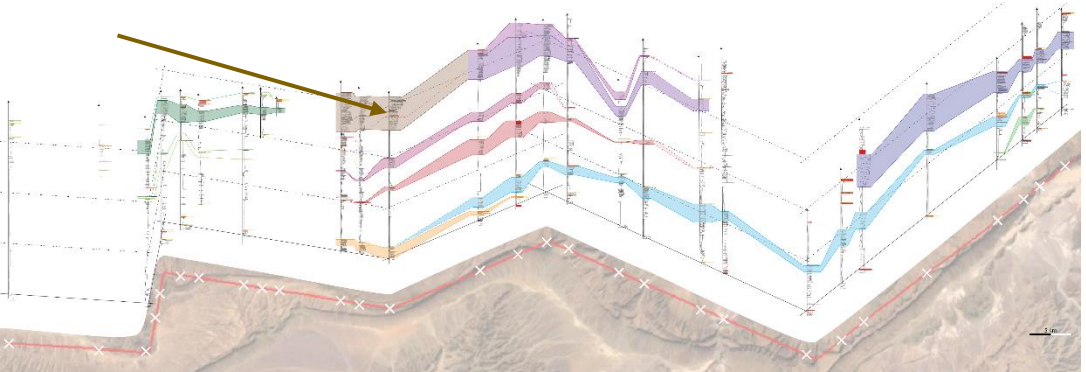


Or South-North oriented?

Major downward shift

Shift of the lobe shape towards the E





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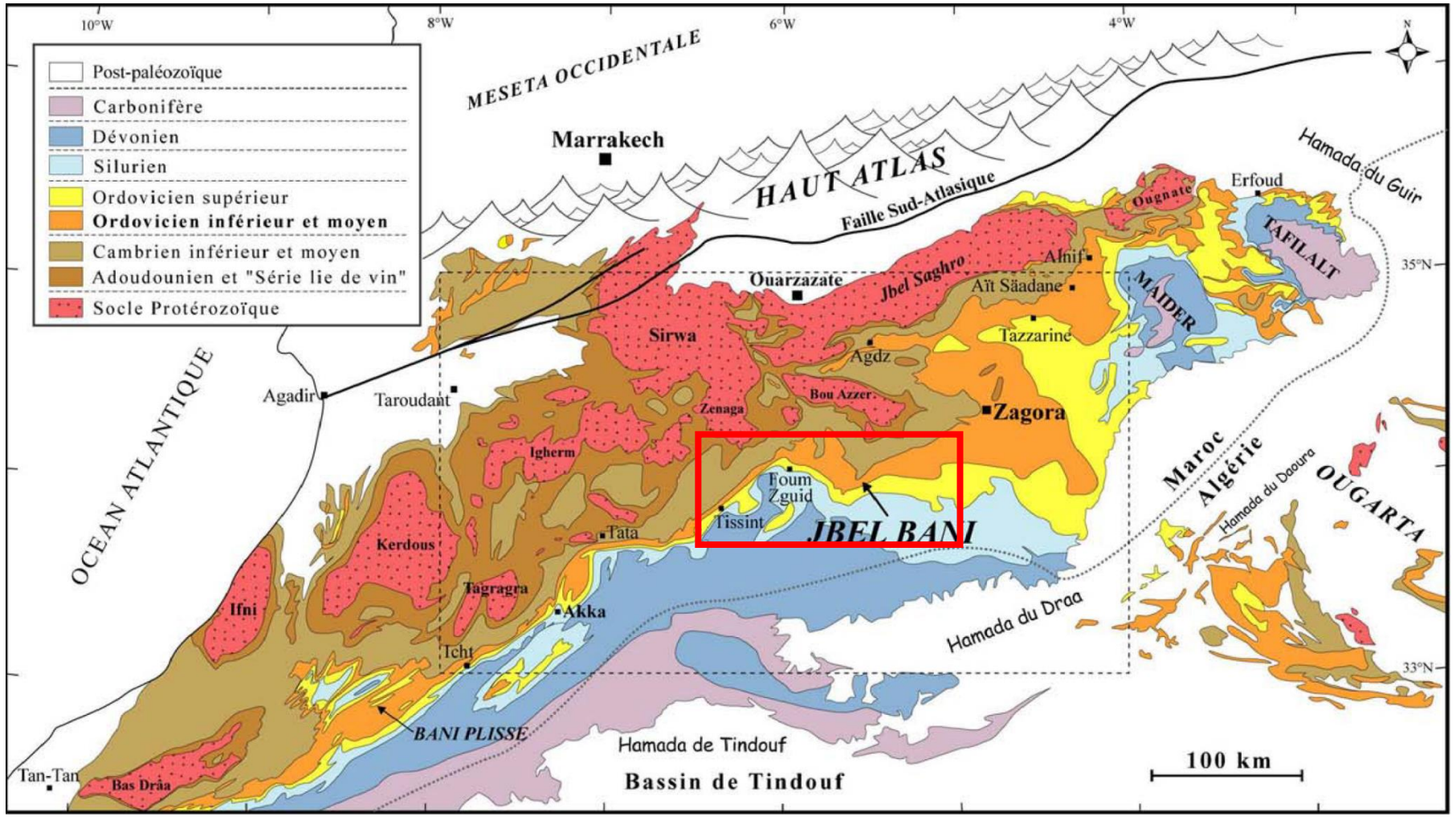
Thank you!

If you have any comments or questions, I am available until the end of EGU or by email:

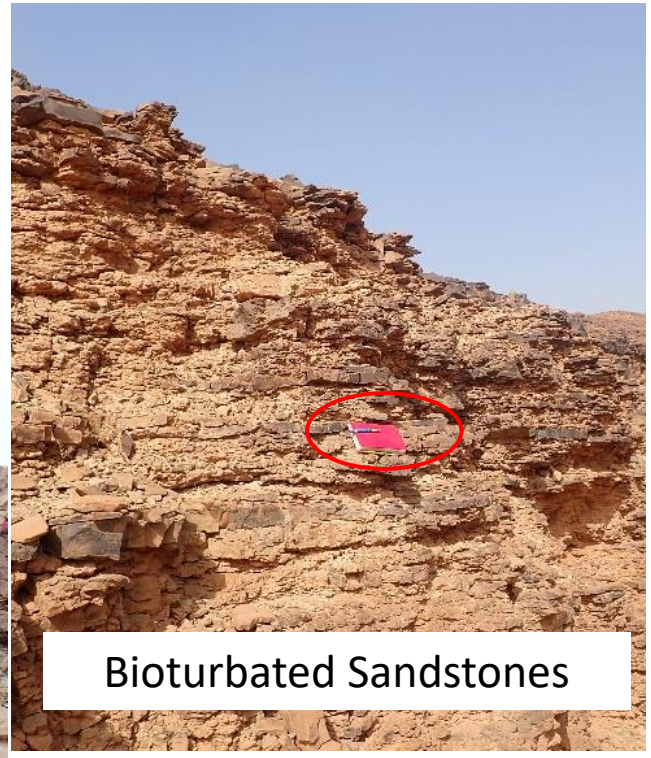
deborah.harlet@geo.unibe.ch

Geological map and studied region



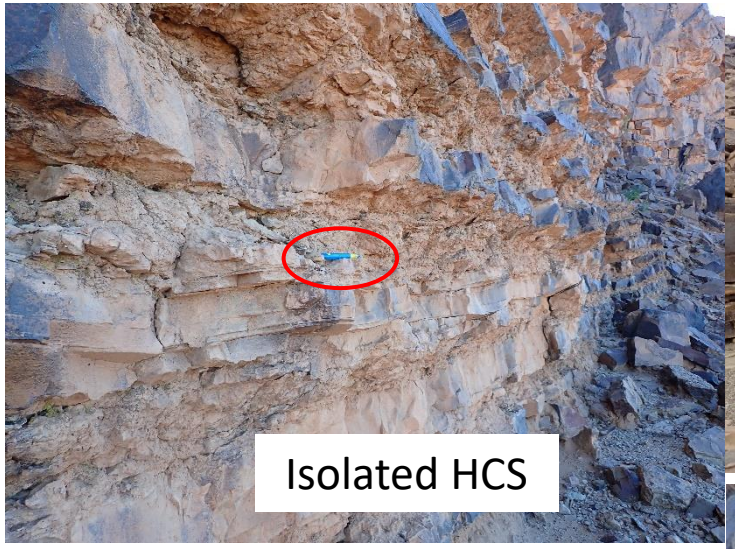
Studied region

Facies associations

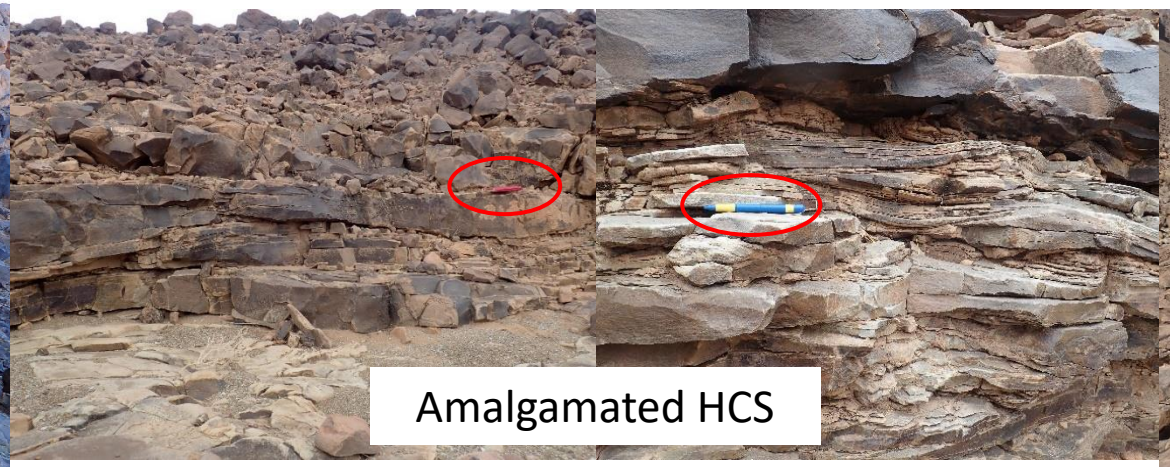


Low-energy facies associations

Facies associations



Isolated HCS



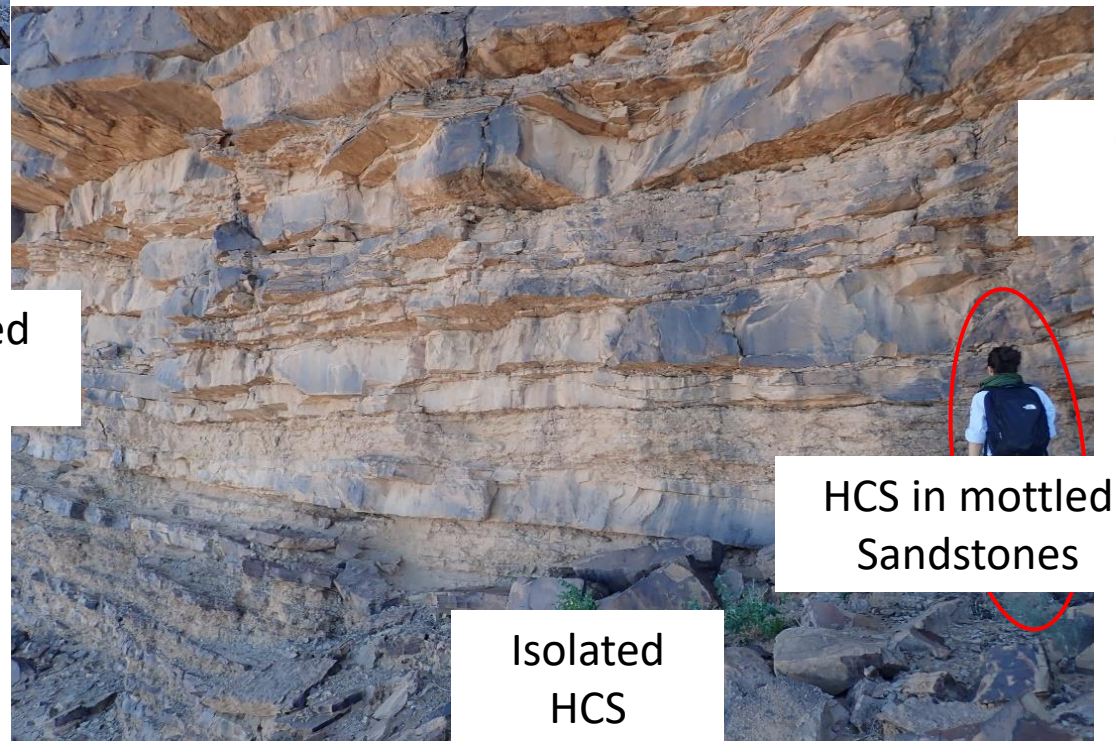
Amalgamated HCS

Massive Amalgamated Sandstones

Channelized and Amalgamated Sandstones

High-energy storm deposits

Amalgamated HCS



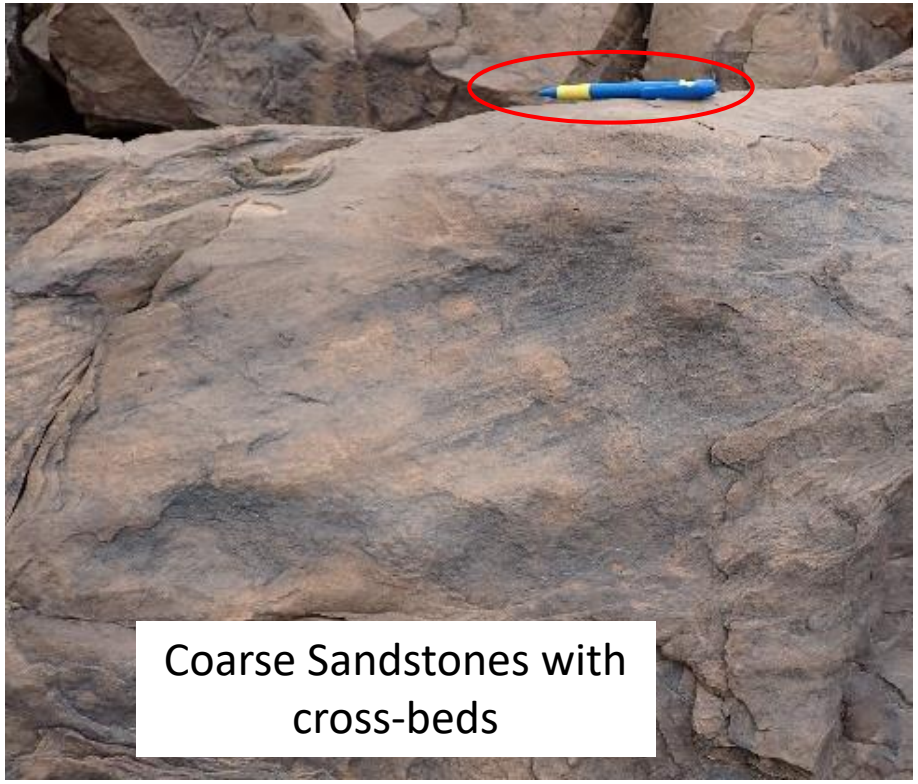
HCS in mottled Sandstones

Isolated HCS

Facies associations

High-energy transgressive deposits

Facies associations



Coarse Sandstones with cross-beds

Very coarse grained with *diplocraterion parallelum*

Coarse Sandstones w/ cross-beds

High-energy tidal (?) deposits

Facies associations

Condensed Levels in shales