

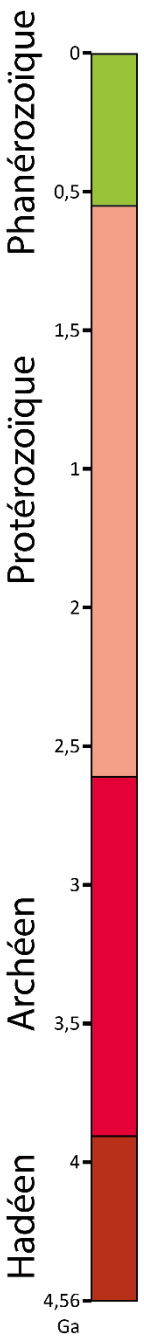
RECONSTITUTIONS PALÉOENVIRONNEMENTALES AU CARBONIFÈRE-PERMIEN

CAS DES BASSINS INTRACONTINENTAUX DU N-E DU MASSIF CENTRAL

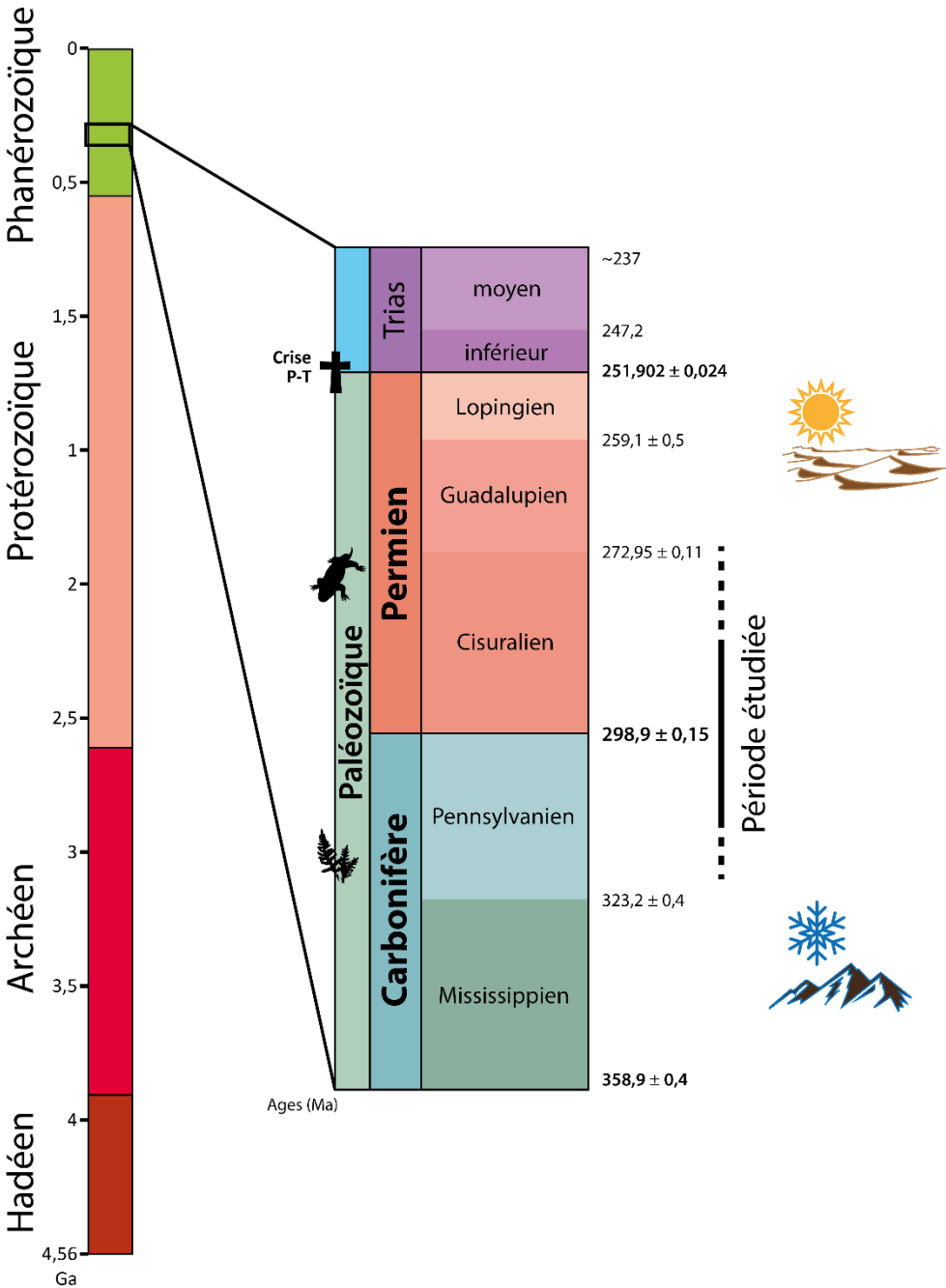
MATHILDE MERCUZOT

*DIRECTION : SYLVIE BOURQUIN, LAURENT BECCALETTO,
PIERRE PELLENARD, ANNE-CATHERINE PIERSON-WICKMANN*

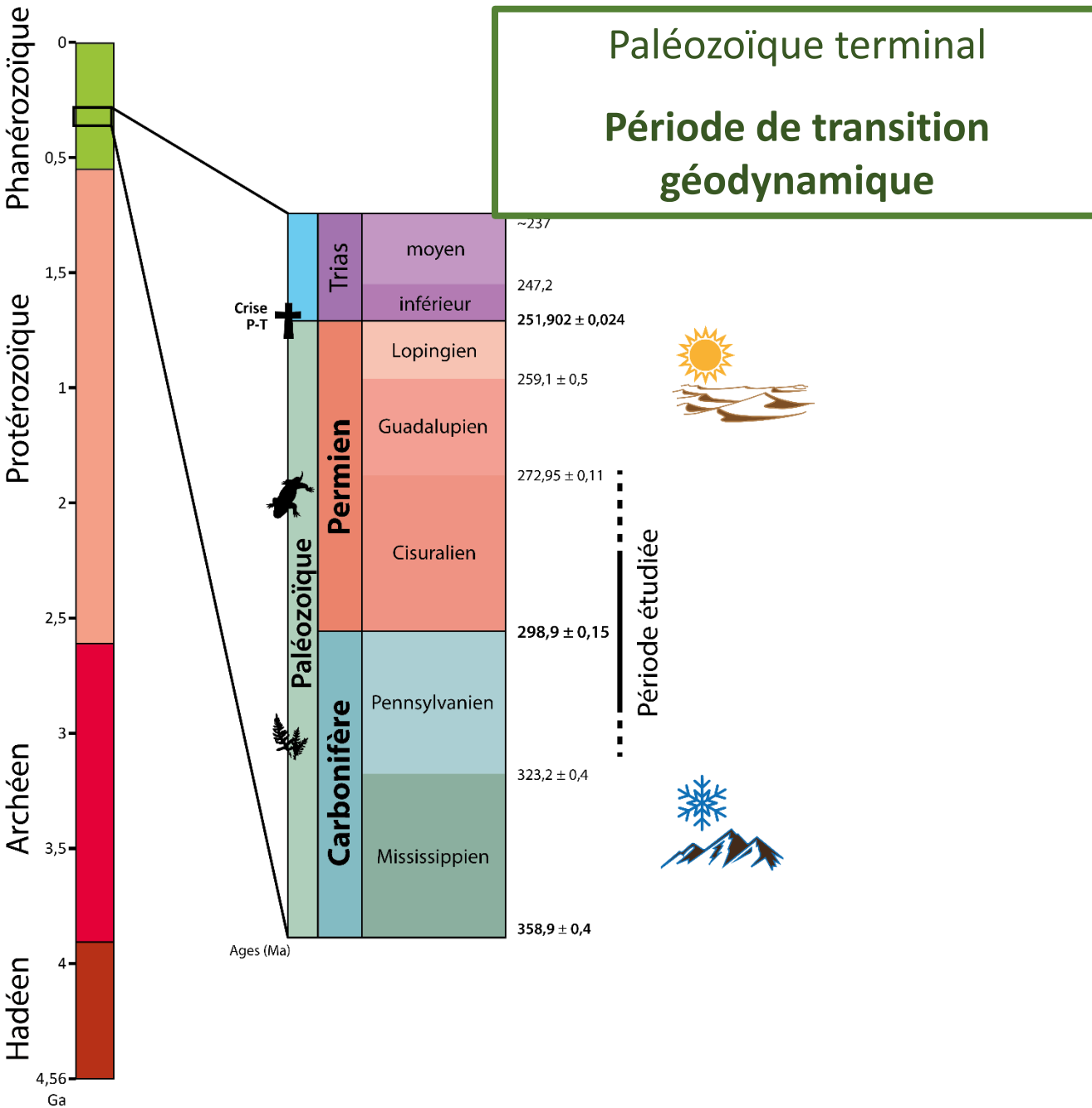
INTRODUCTION



INTRODUCTION



INTRODUCTION



INTRODUCTION

Paléozoïque terminal

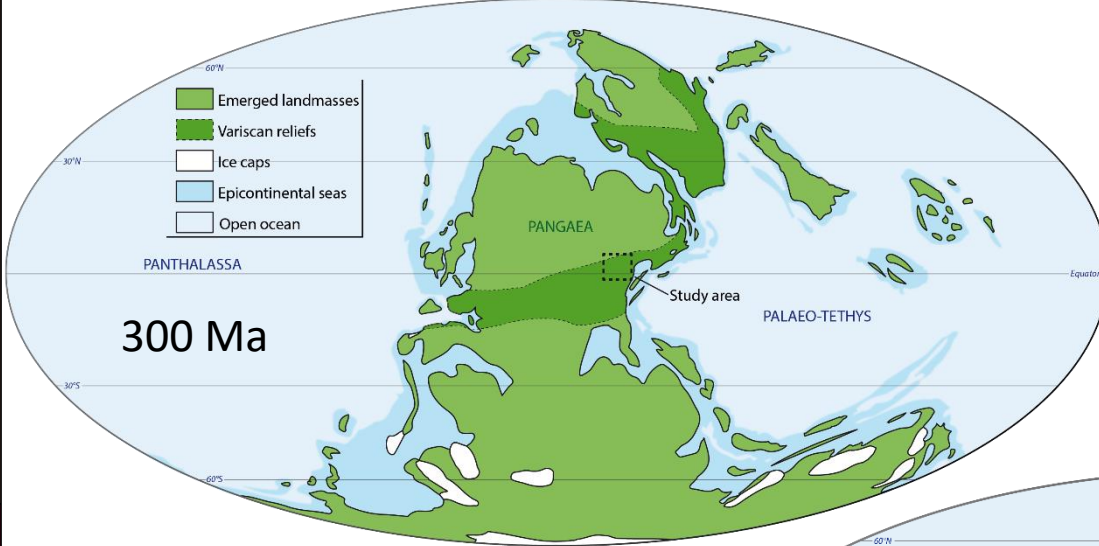
Période de transition
géodynamique

Phanérozoïque
0
0,5
1,5
2
2,5
3
3,5
4
4,56
Ga

Protérozoïque
1,5
2
2,5

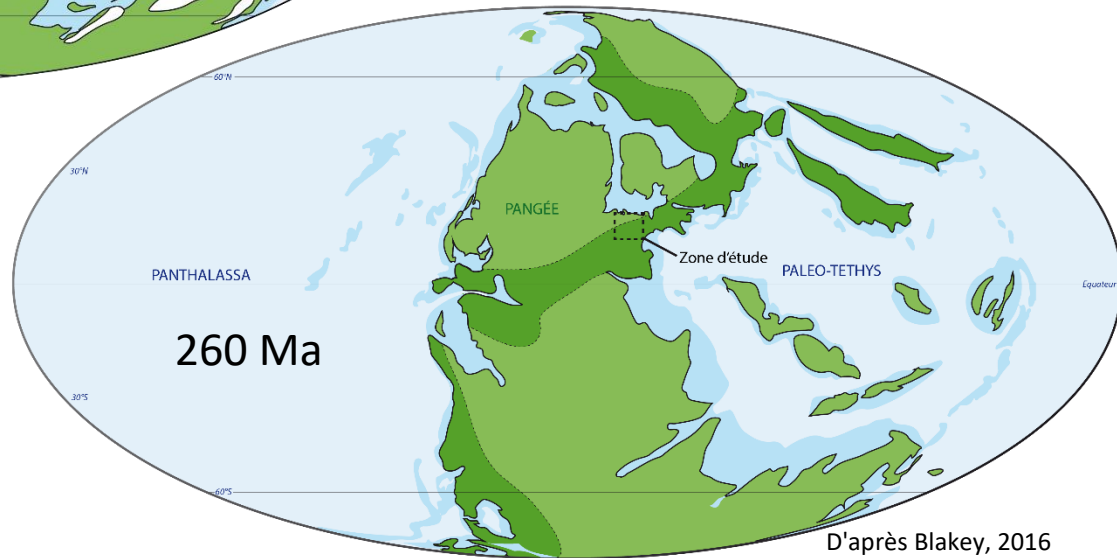
Archéen
3
3,5

Hadéen
4
4,56



300 Ma

Réorganisation
paléogéographique:
Formation de la Pangée



260 Ma

D'après Blakey, 2016

INTRODUCTION

Paléozoïque terminal

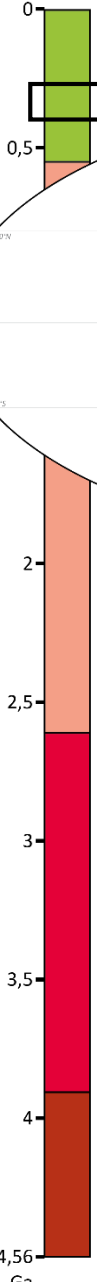
Période de transition géodynamique

Phanérozoïque

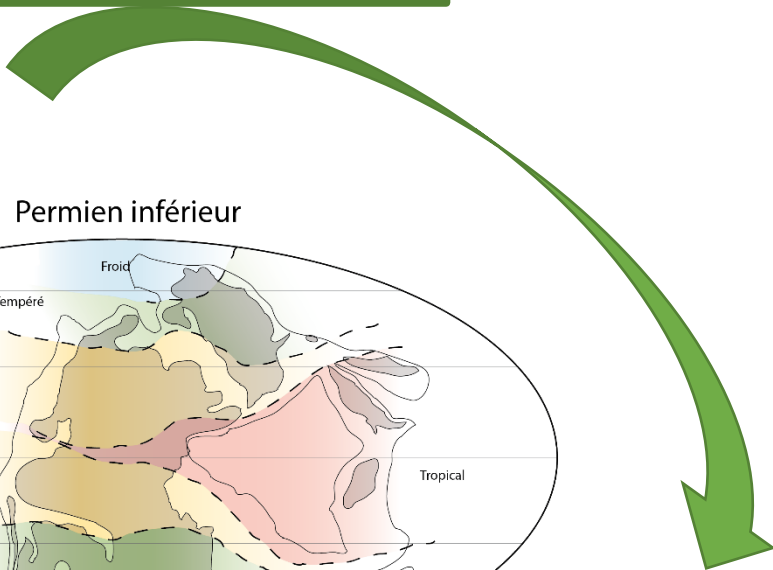
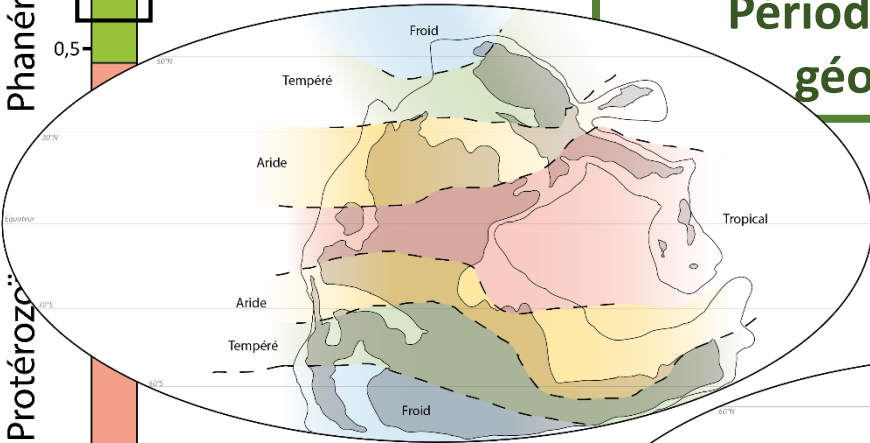
Protérozoïque

Archéen

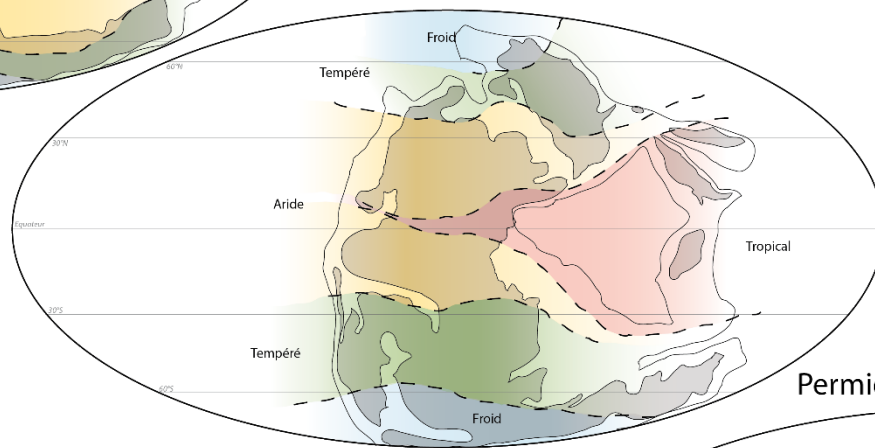
Hadéen



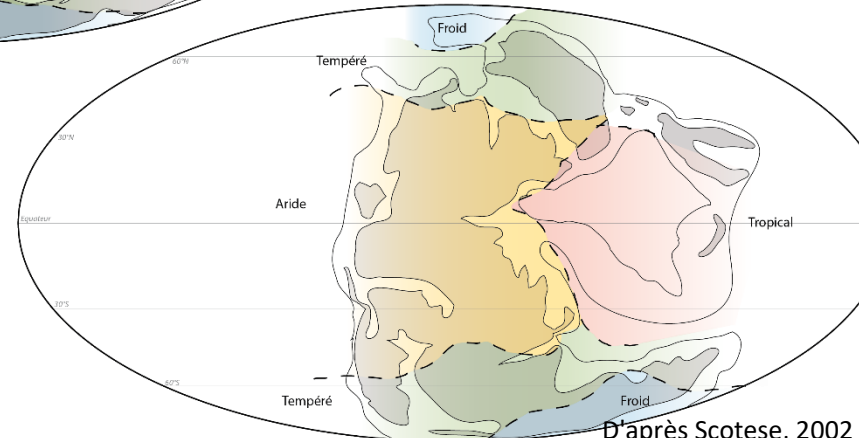
Carbonifère supérieur



Permien inférieur



Permien moyen et supérieur



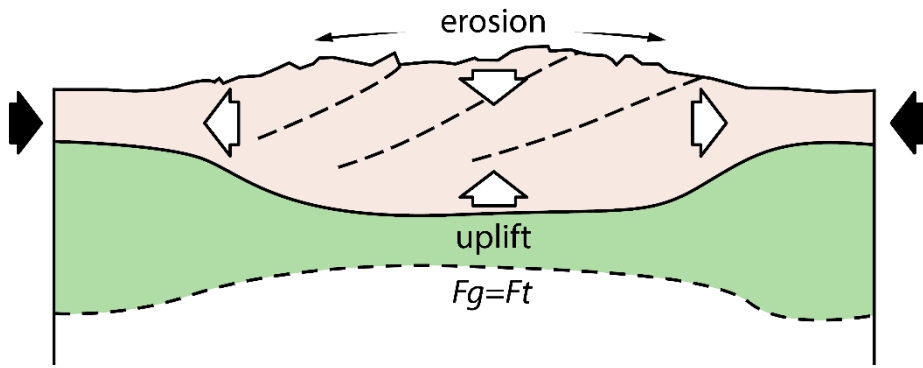
Transition climatique

Icehouse* → *greenhouse

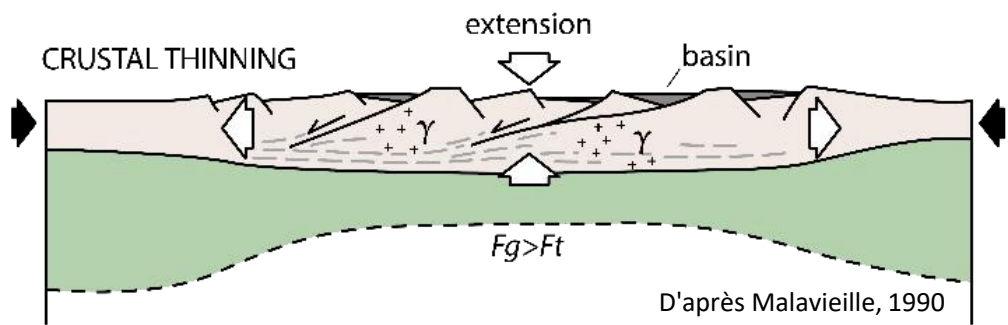
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Paléozoïque terminal
Période de transition
géodynamique



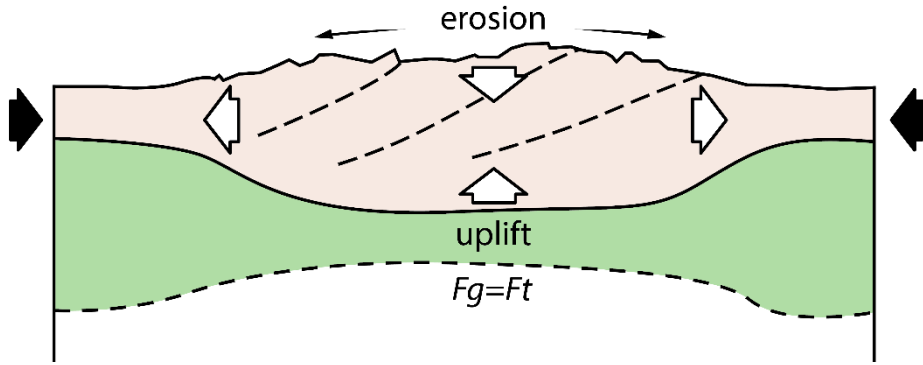
Fin de l'orogénèse varisque
Développement de bassins intramontagneux
tardi-orogéniques extensifs



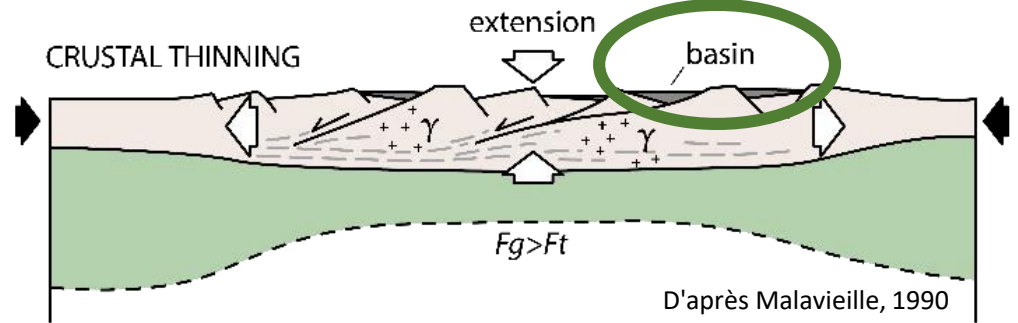
INTRODUCTION

Phanérozoïque
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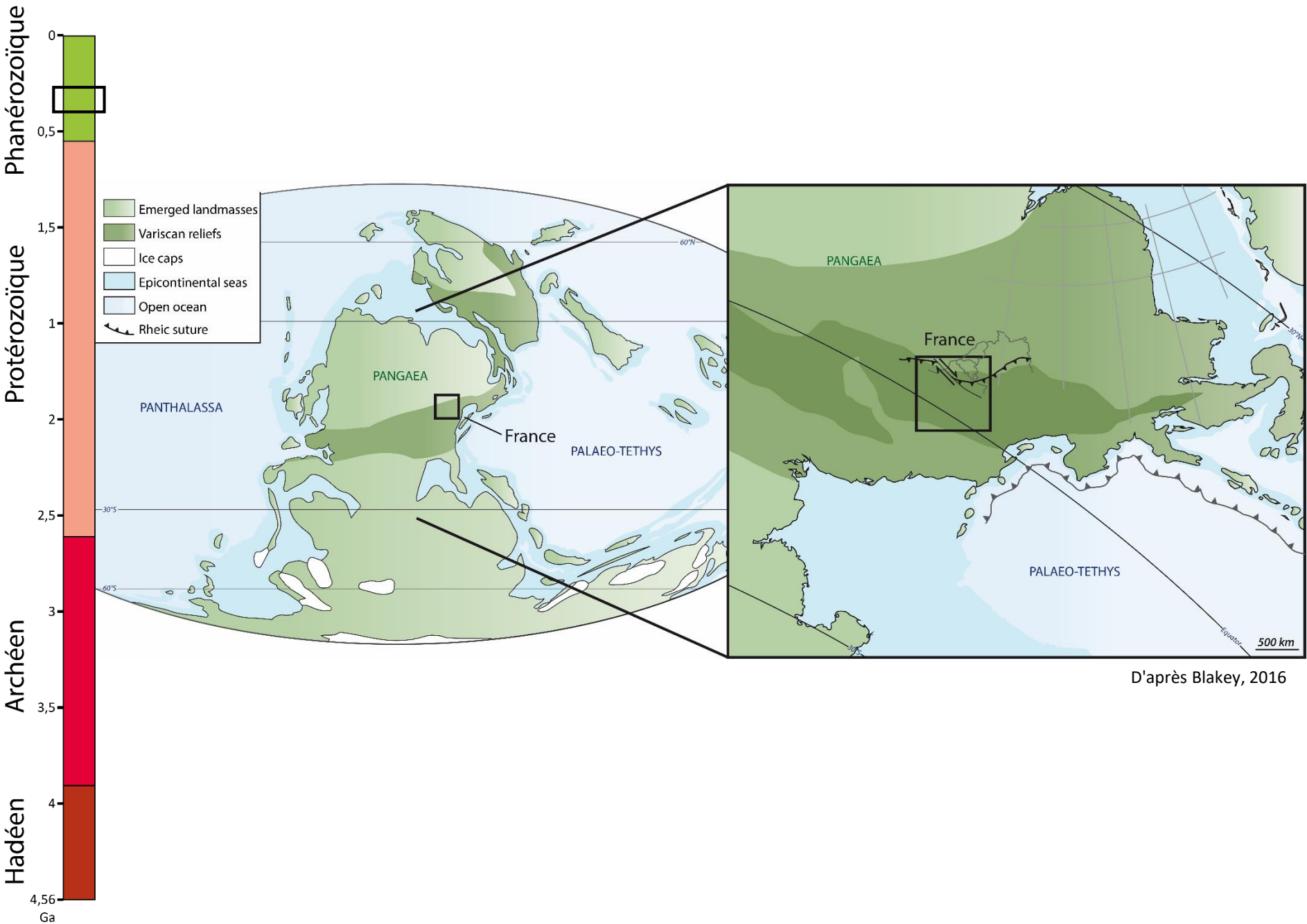
Paléozoïque terminal
Période de transition géodynamique



Fin de l'orogénèse varisque
Développement de bassins intramontagneux tardi-orogéniques extensifs

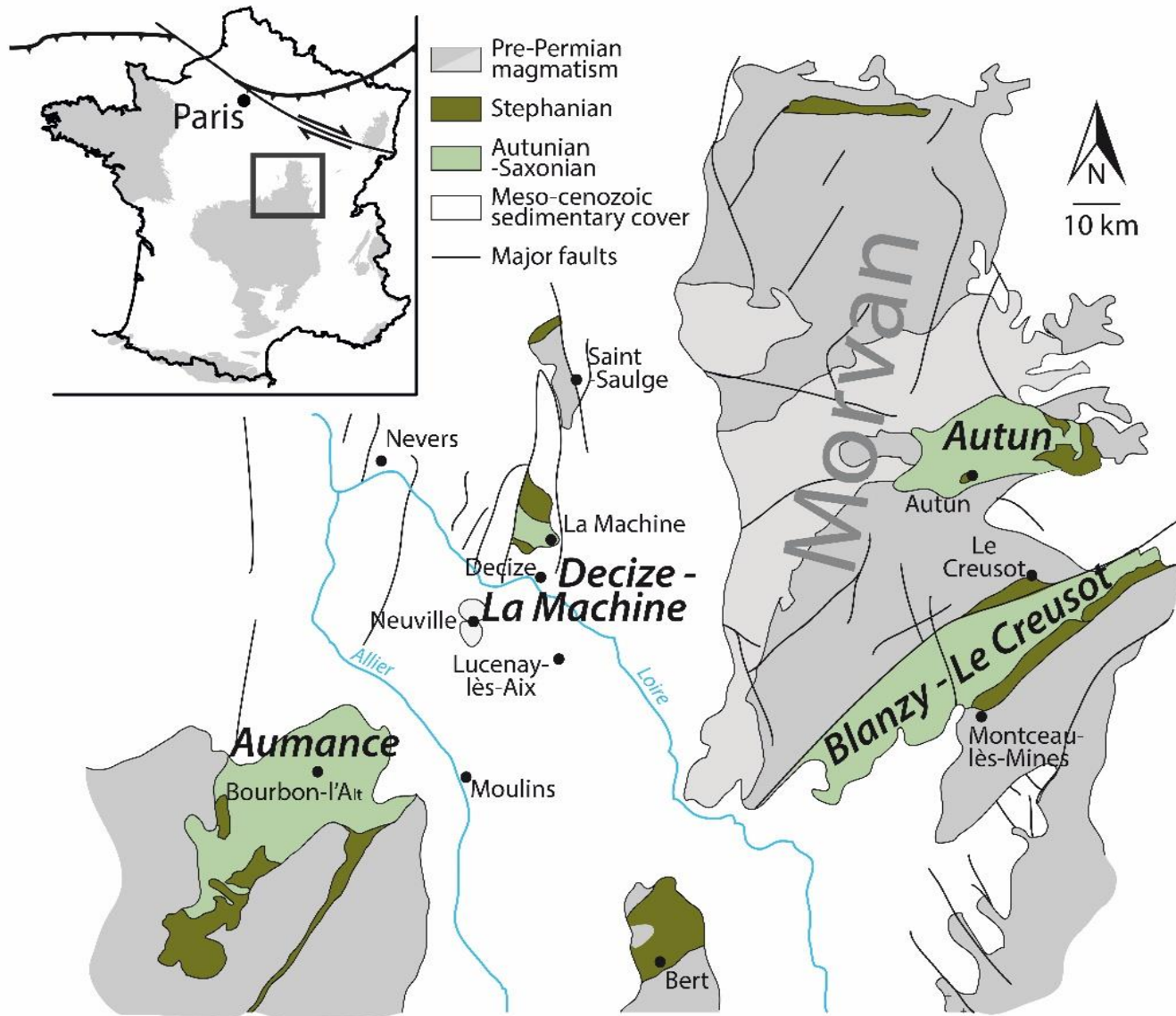


ZONE D'ÉTUDE



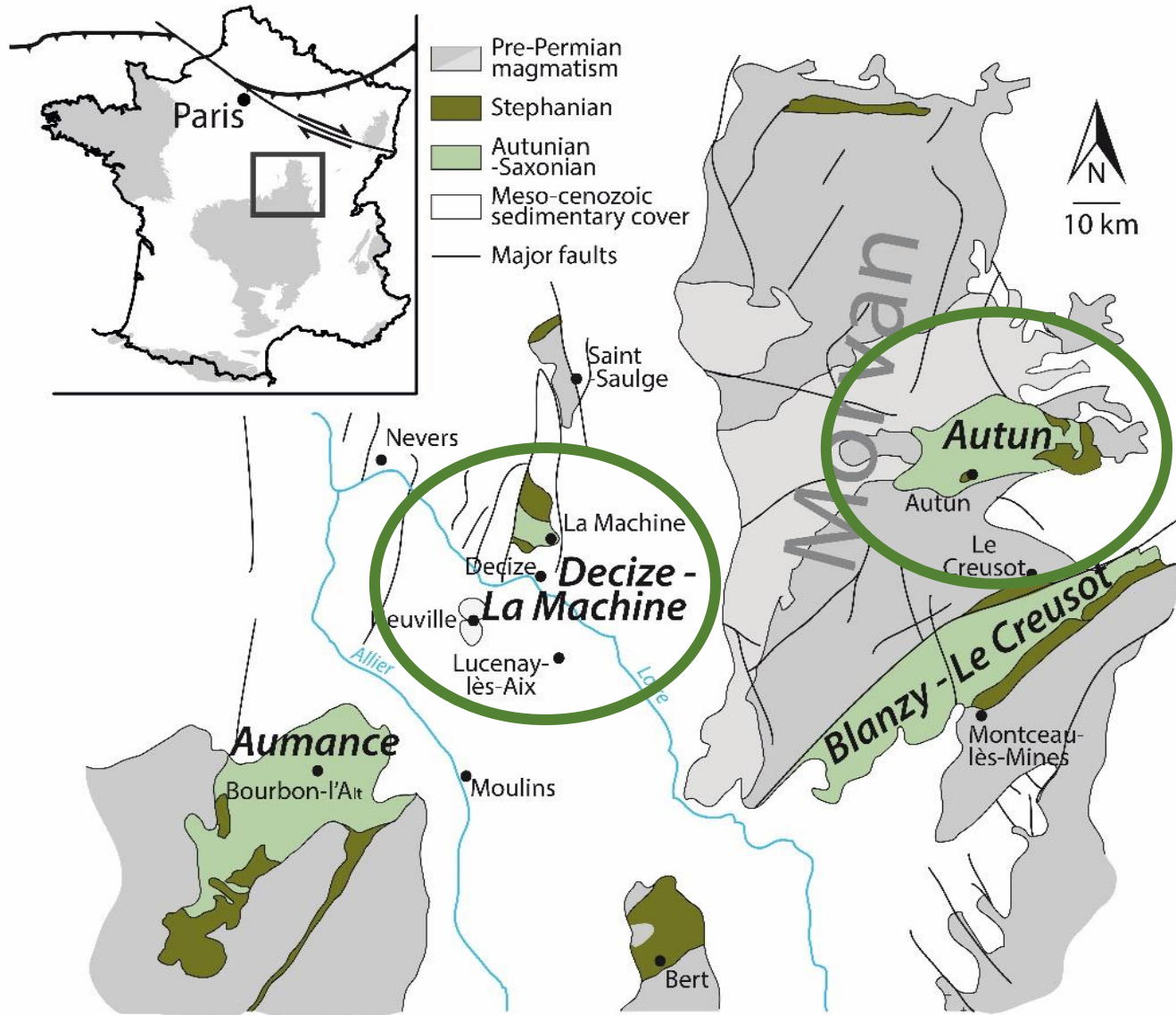
D'après Blakey, 2016

ZONE D'ÉTUDE



D'après Elsass-Damon, 1977

ZONE D'ÉTUDE



- **Place paléogéographique stratégique**
(domaine intracontinental, intertropical, intra-chaîne varisque)
- **Paléoenvironnements et paléoclimats peu étudiés**

- **Place paléogéographique stratégique**
(domaine intracontinental, intertropical, intra-chaîne varisque)
- **Paléoenvironnements et paléoclimats peu étudiés**

Quel enregistrement sédimentaire pour quels facteurs géodynamiques ?
(paléoenvironnements – paléoclimats – tectonique)

Quelle échelle des facteurs géodynamiques enregistrés ?
(locale vs. régionale/globale)

Modèle applicable à d'autres bassins intertropicaux ?
(e.g. domaine occidental de la chaîne varisque)

Réévaluations

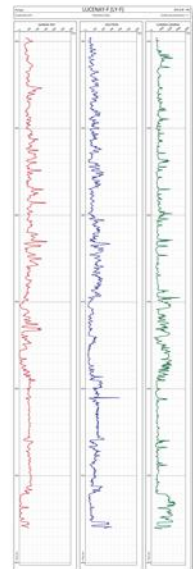
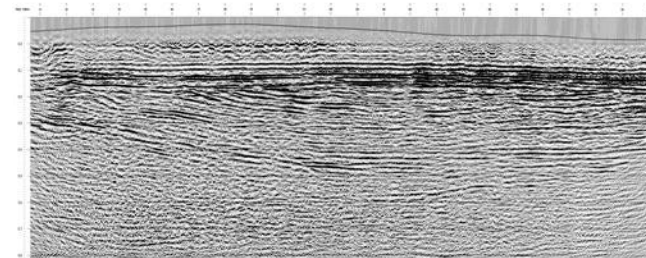
Rapports miniers

Forages carottés

Diagraphies

Profils sismiques

Affleurements



Réévaluations

Rapports miniers

Forages carottés

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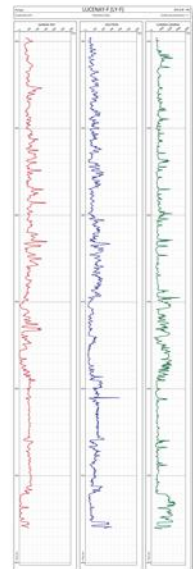
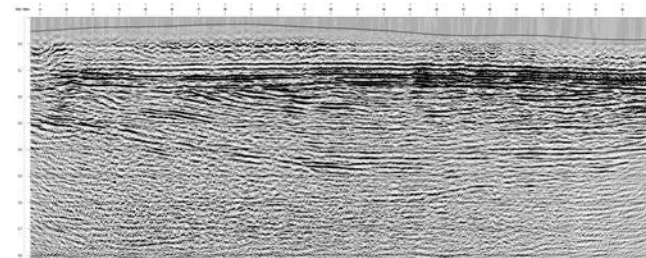
Nouvelles données

Sédimentologie
faciès, architectures

Minéralogie des argiles

Géochimie organique

Datations radiométriques



Réévaluations

Rapports miniers

Forages carottés

Diagraphies

Profils sismiques

Affleurements



Nouvelles données

Sédimentologie
faciès, architectures

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Géochimie organique

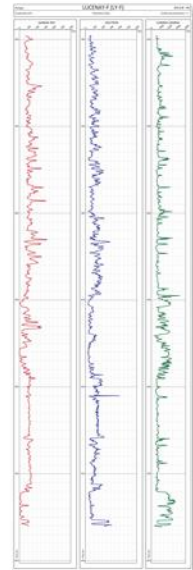
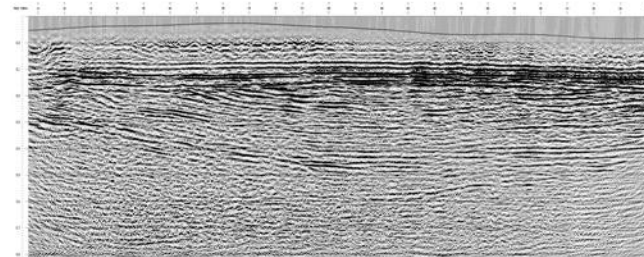
Datations radiométriques



Résultats

Paléoenvironnements

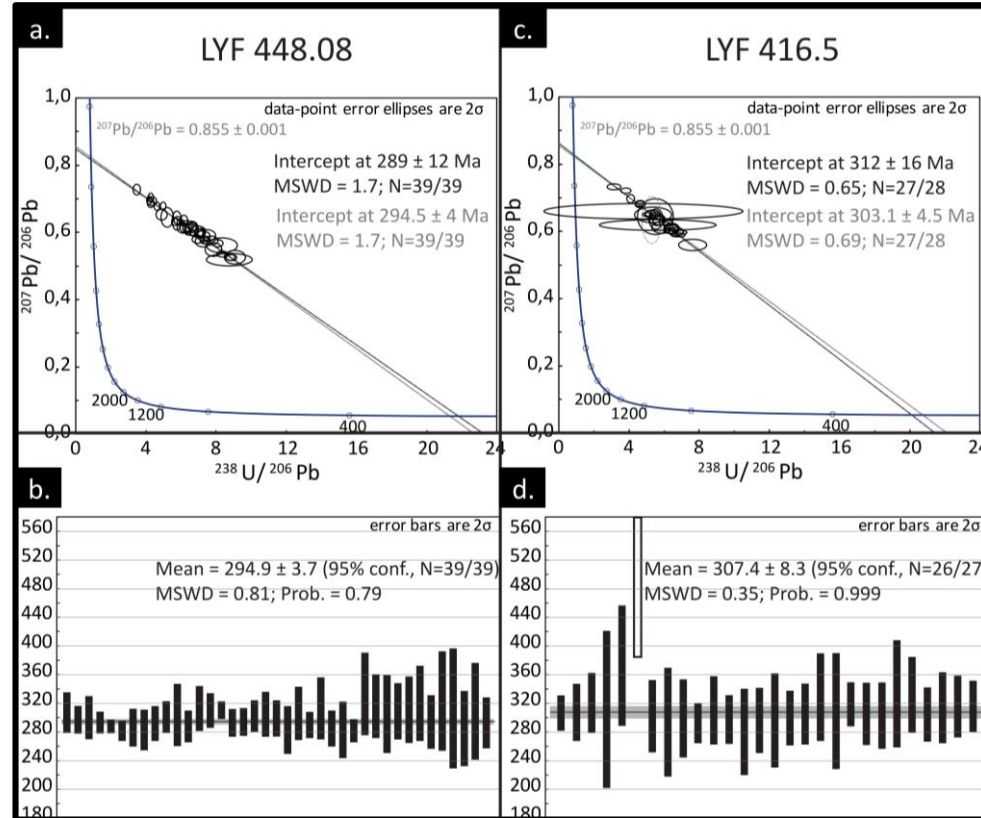
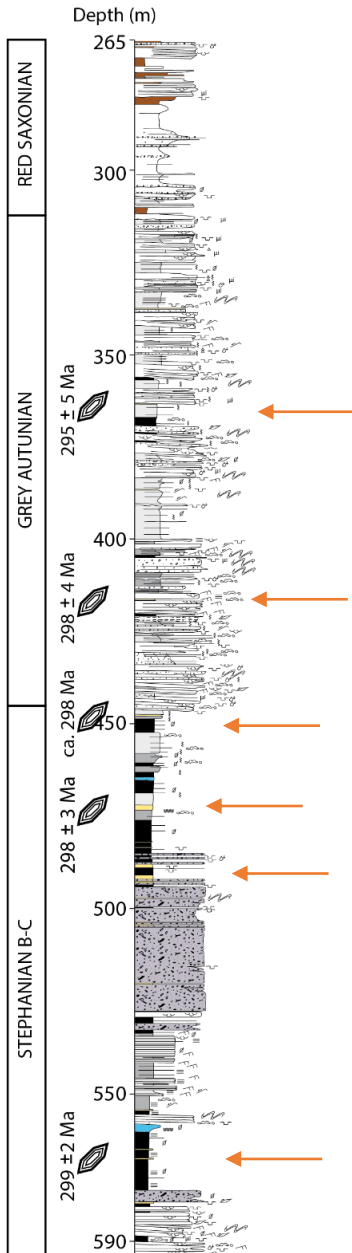
Paléoclimats
locaux vs. globaux



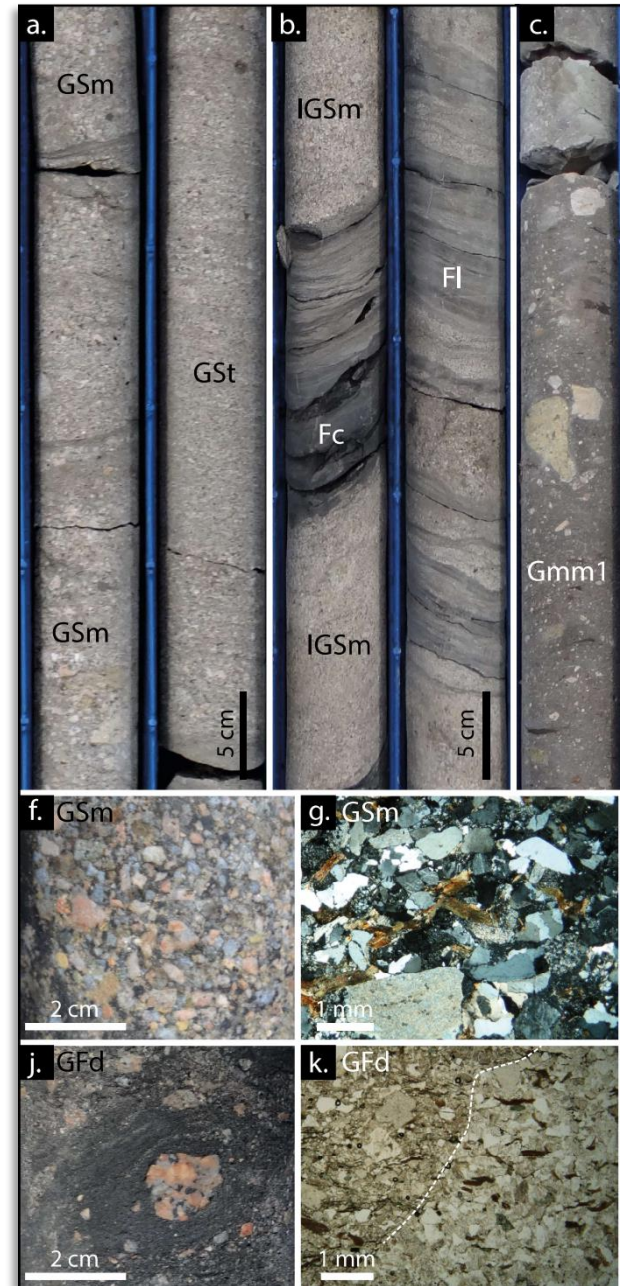
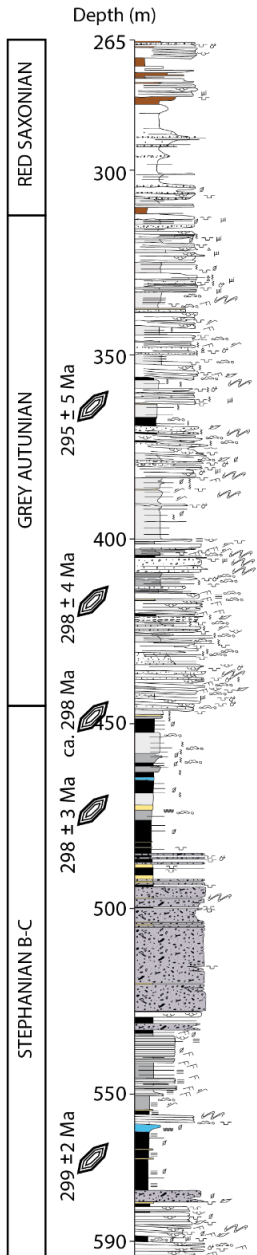
A detailed diorama of a prehistoric forest. The scene is filled with large, textured tree trunks, some with reddish-brown bark. The ground is covered with various types of ferns and other lush vegetation. A large, dark log lies horizontally across the middle ground. In the background, more trees and a misty atmosphere create a sense of depth. A large dragonfly with translucent wings is perched on a branch on the right side. The overall lighting is soft and naturalistic.

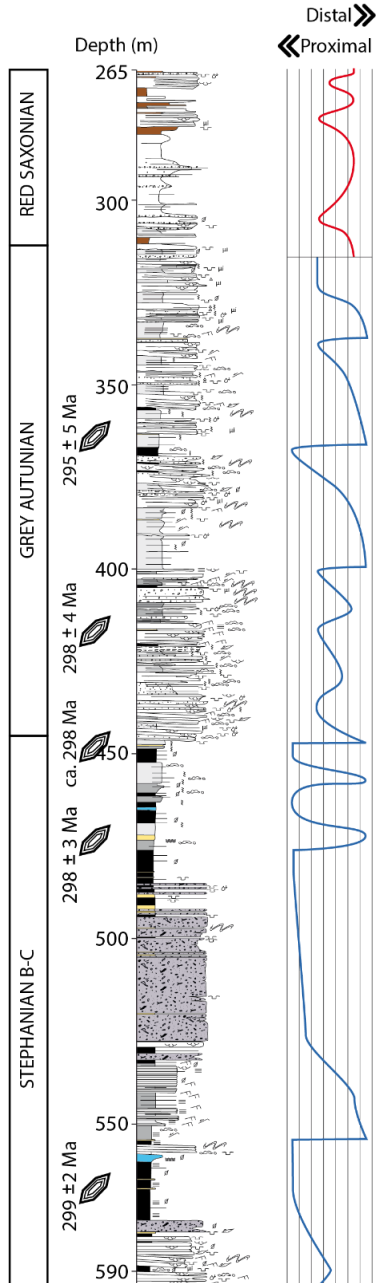
SÉDIMENTOLOGIE

Datations U-Pb sur zircon & apatite (LA-ICP-MS)



Descriptions sédimentologiques

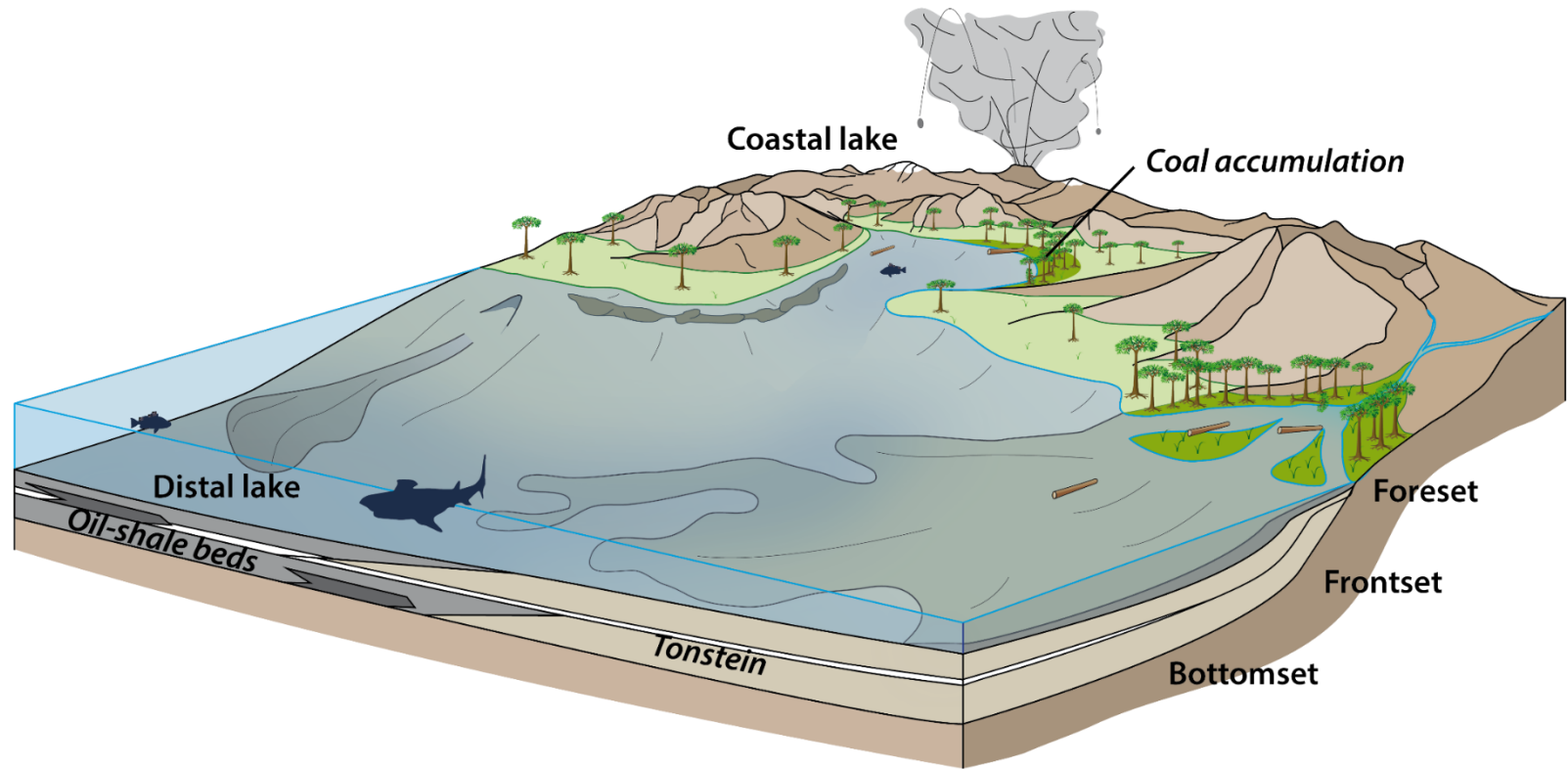




Descriptions sédimentologiques

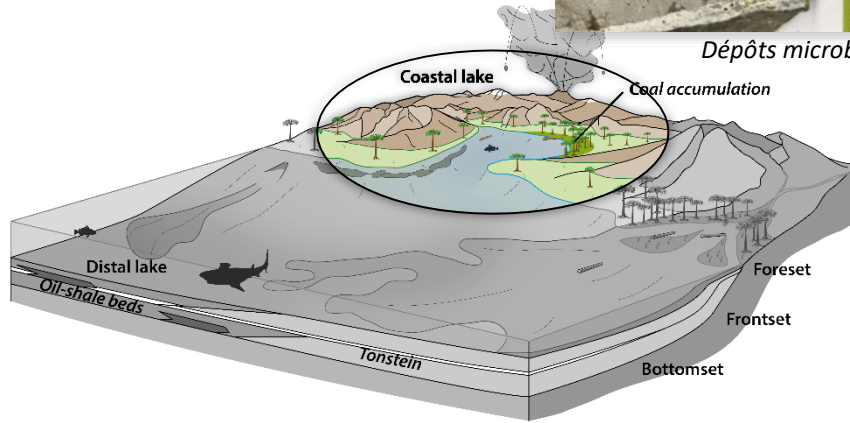
- Environnements de dépôt

AUTUN BASIN - DEPOSITIONAL ENVIRONMENTS



DEPOSITIONAL E

Lac côtier

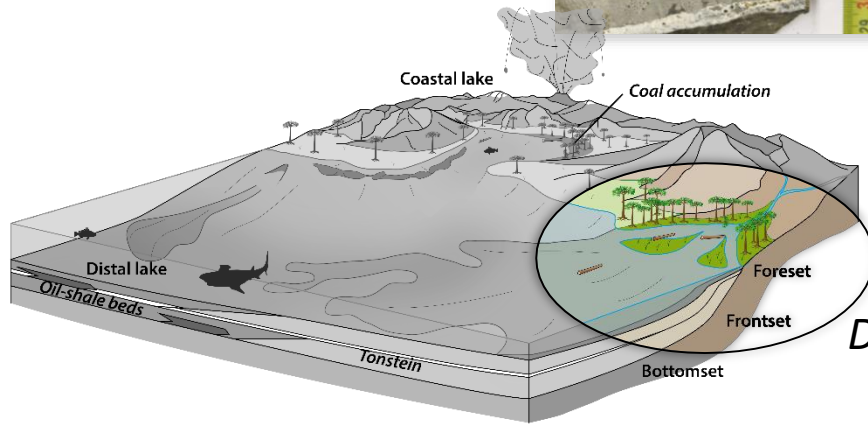


Dépôts microbiens



Siltite riche en écailles de poissons et coprolithes

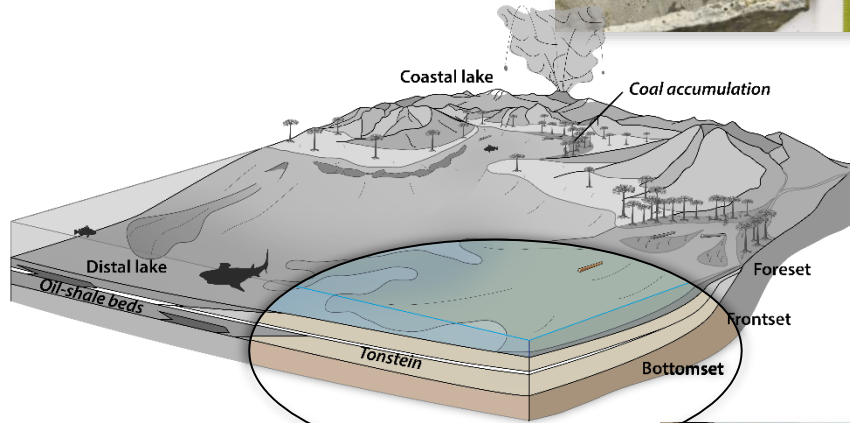
DEPOSITIONAL E



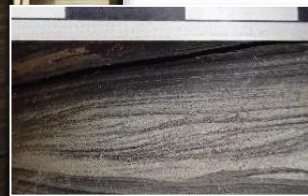
Delta

Sets inclinés & mégarides 3D

DEPOSITIONAL E



Lac proximal



Turbidites

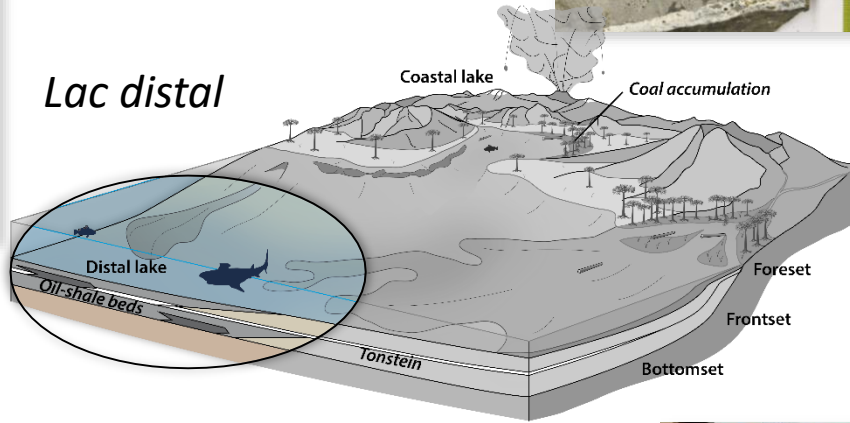


DEPOSITIONAL E

Mass-flow distal



Lac distal



Argillites carbonées

"schistes bitumineux"

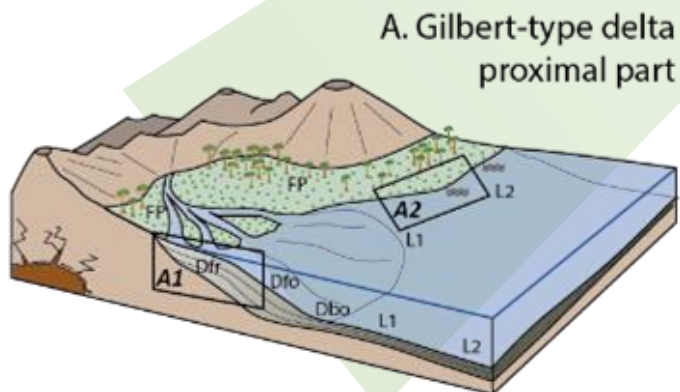
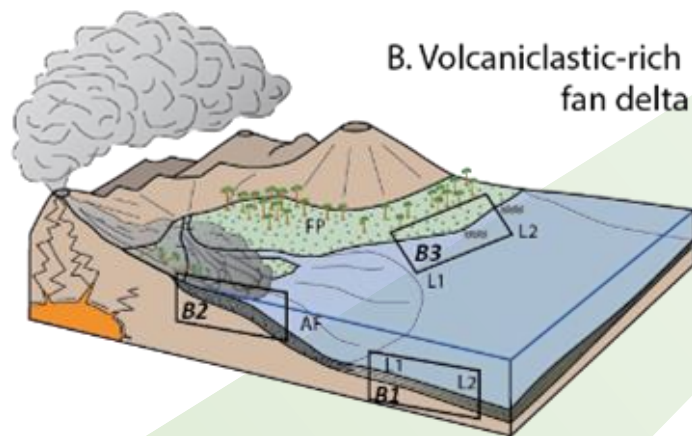
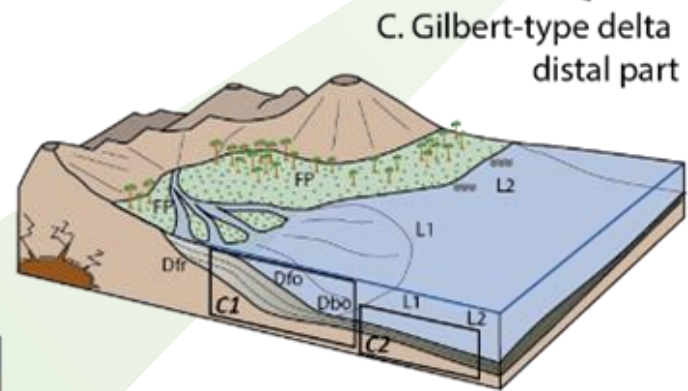
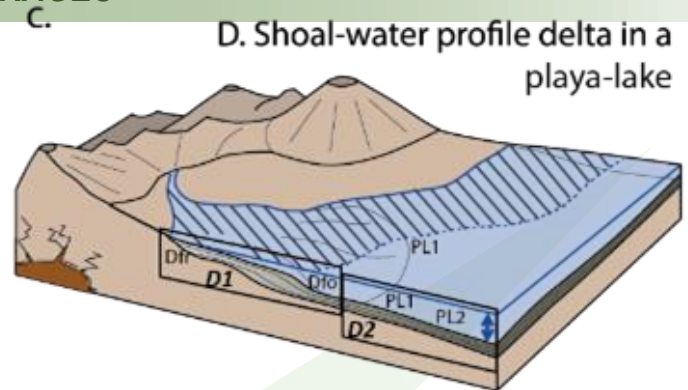


Turbidites

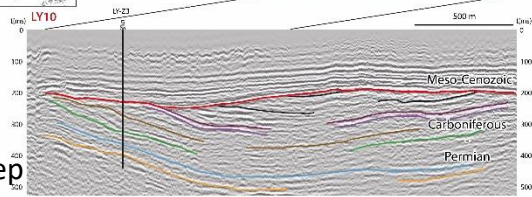
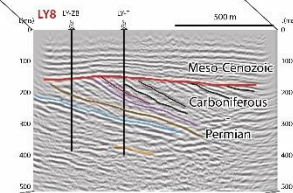
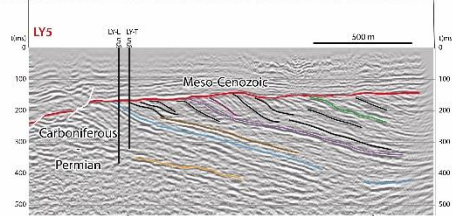
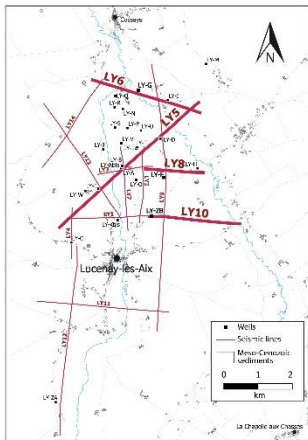
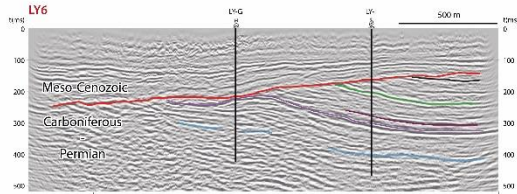
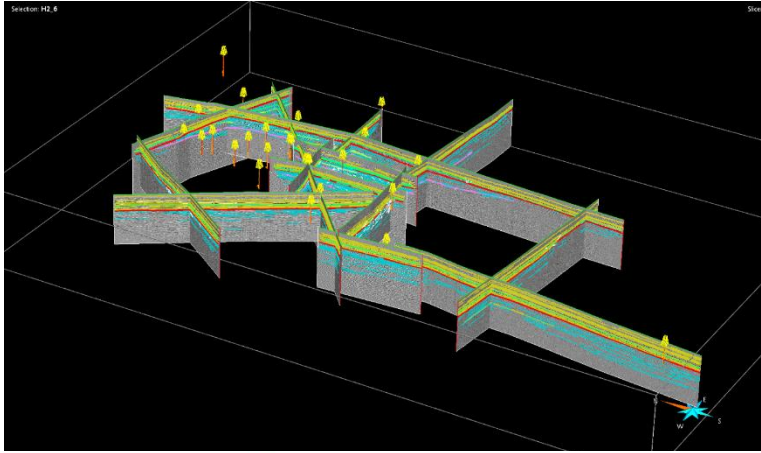


DESCRIPTION DE FORAGES

➤ Evolution temporelle

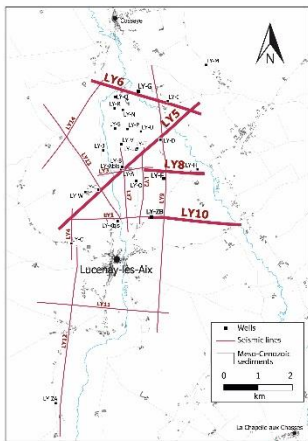
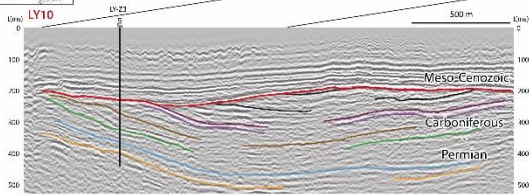
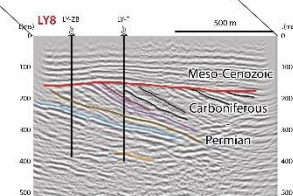
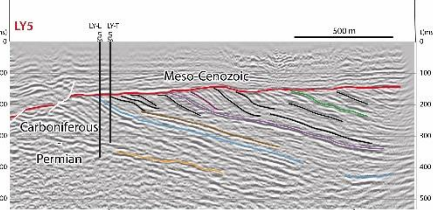
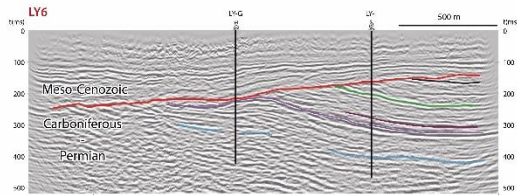
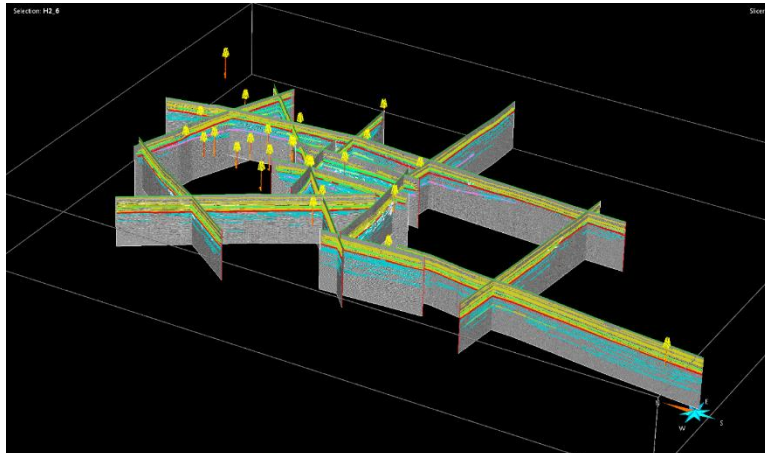


Modèle sismique (visualiseur 3D SKUA-GoCad)

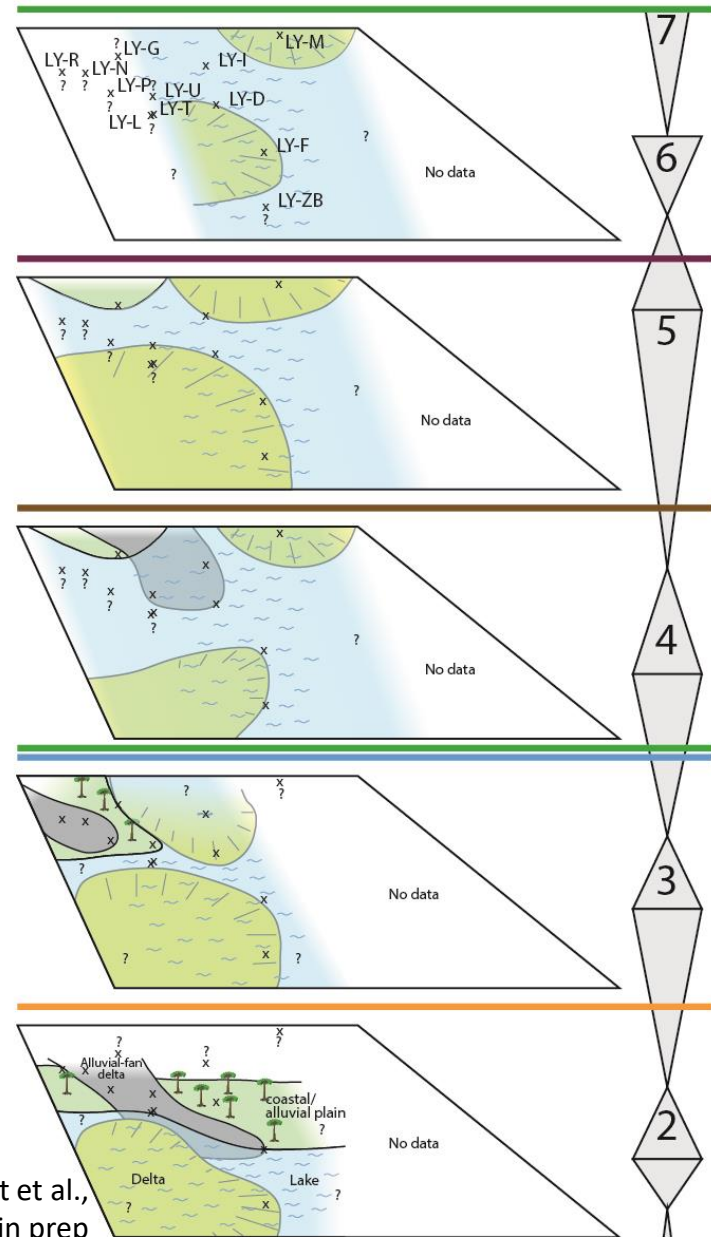


MODÈLE SISMIQUE – STRATIGRAPHIE SÉQUENTIELLE

Modèle sismique (visualiseur 3D SKUA-GoCad)



Cartes paléogéographiques à l'échelle du bassin

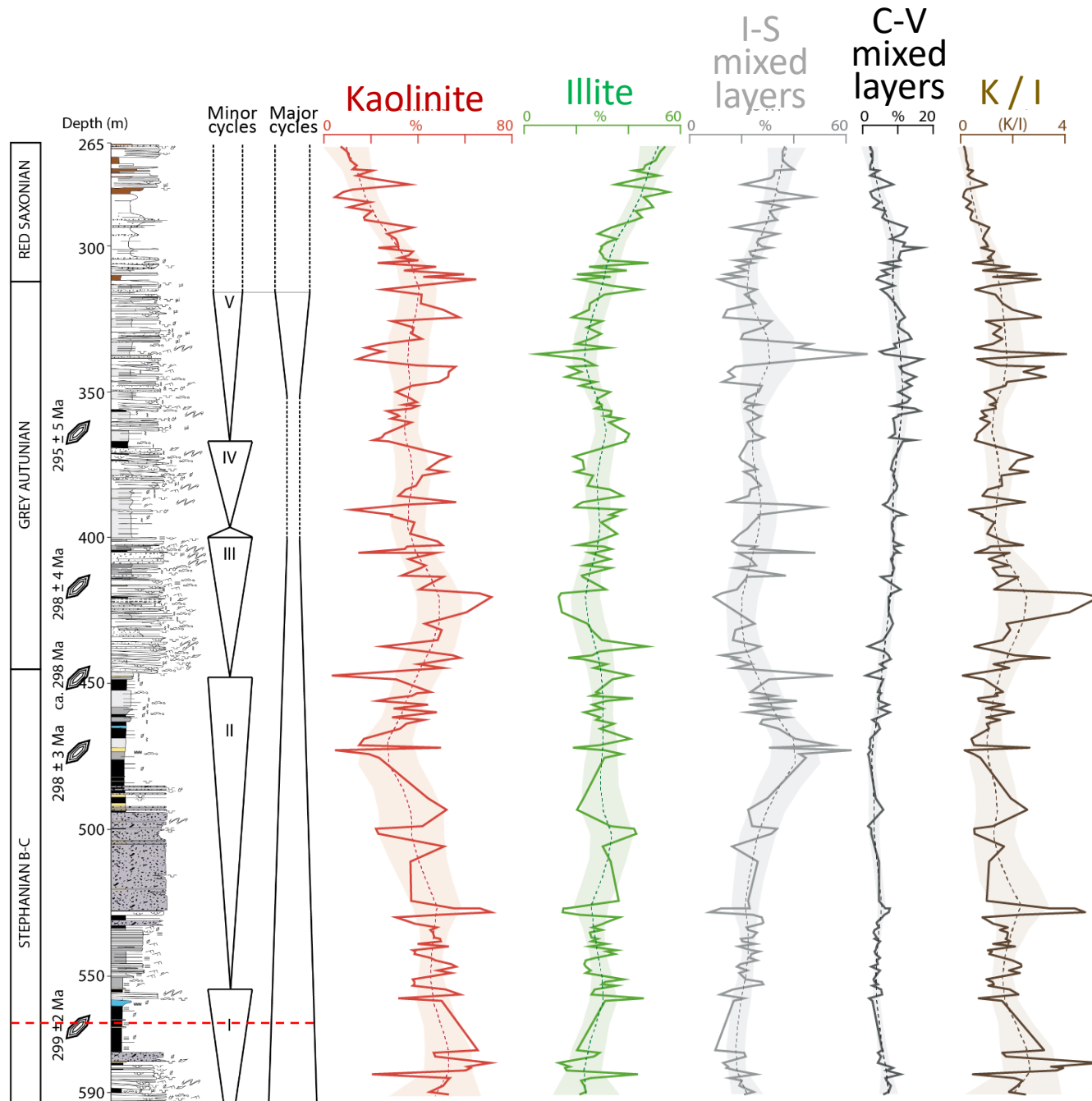


Mercuzot et al.,
in prep

A detailed diorama of a prehistoric forest, likely from the Mesozoic or Paleozoic eras. The scene is filled with lush greenery, including various types of ferns, mosses, and small plants. Several large, textured tree trunks are visible, some with reddish-brown bark. In the foreground, a large, weathered log lies horizontally. A dragonfly is perched on a branch to the right. The background shows a dense forest of tall, thin trees, creating a sense of depth. The overall lighting is soft and naturalistic, highlighting the textures of the plants and wood. The word "MINÉRALOGIE" is overlaid in the center in a bold, white, sans-serif font.

MINÉRALOGIE

FORAGE LY-F



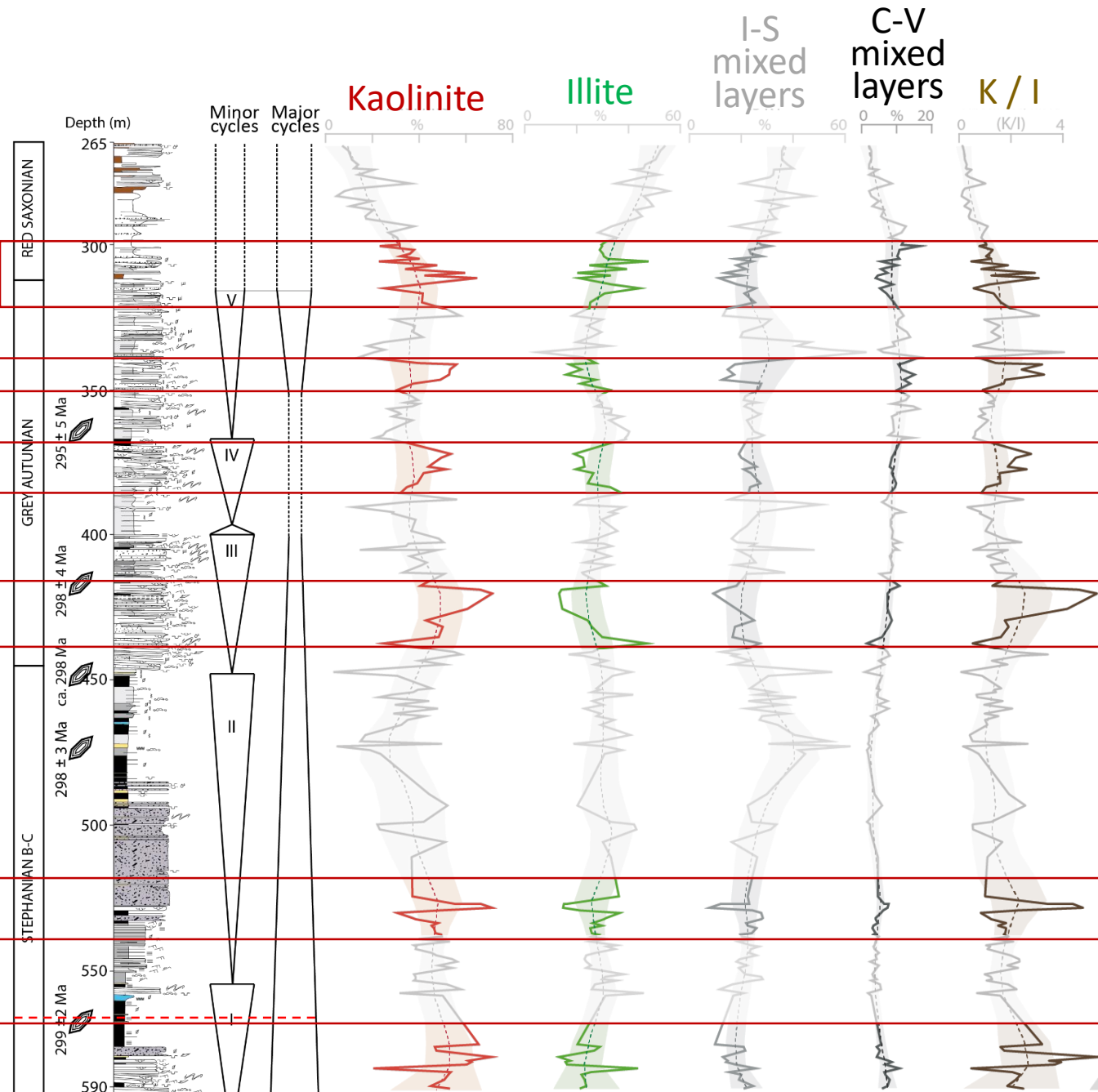
**Assemblage argileux
détritique:**

**Signature des bassins
versants érodés**

+

**Processus d'altération de
surface (via climat)**

MINÉRALOGIE – LY-F



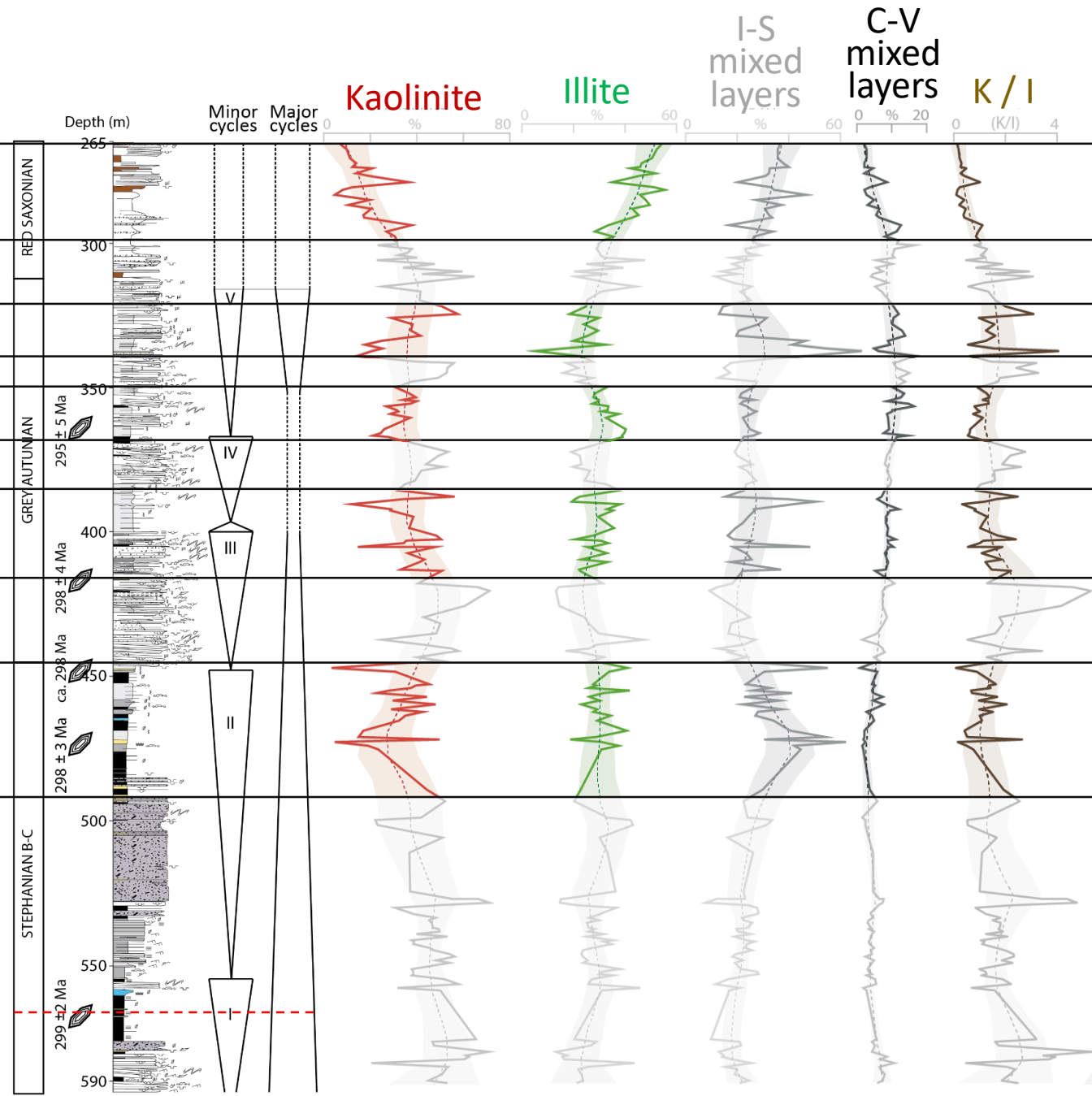
Forts apports sédimentaires

Kaolinite
Illite

Hydrolyse poussée

-> humidité ?

MINÉRALOGIE – LY-F



Faibles flux sédimentaires

Kaolinite
Illite

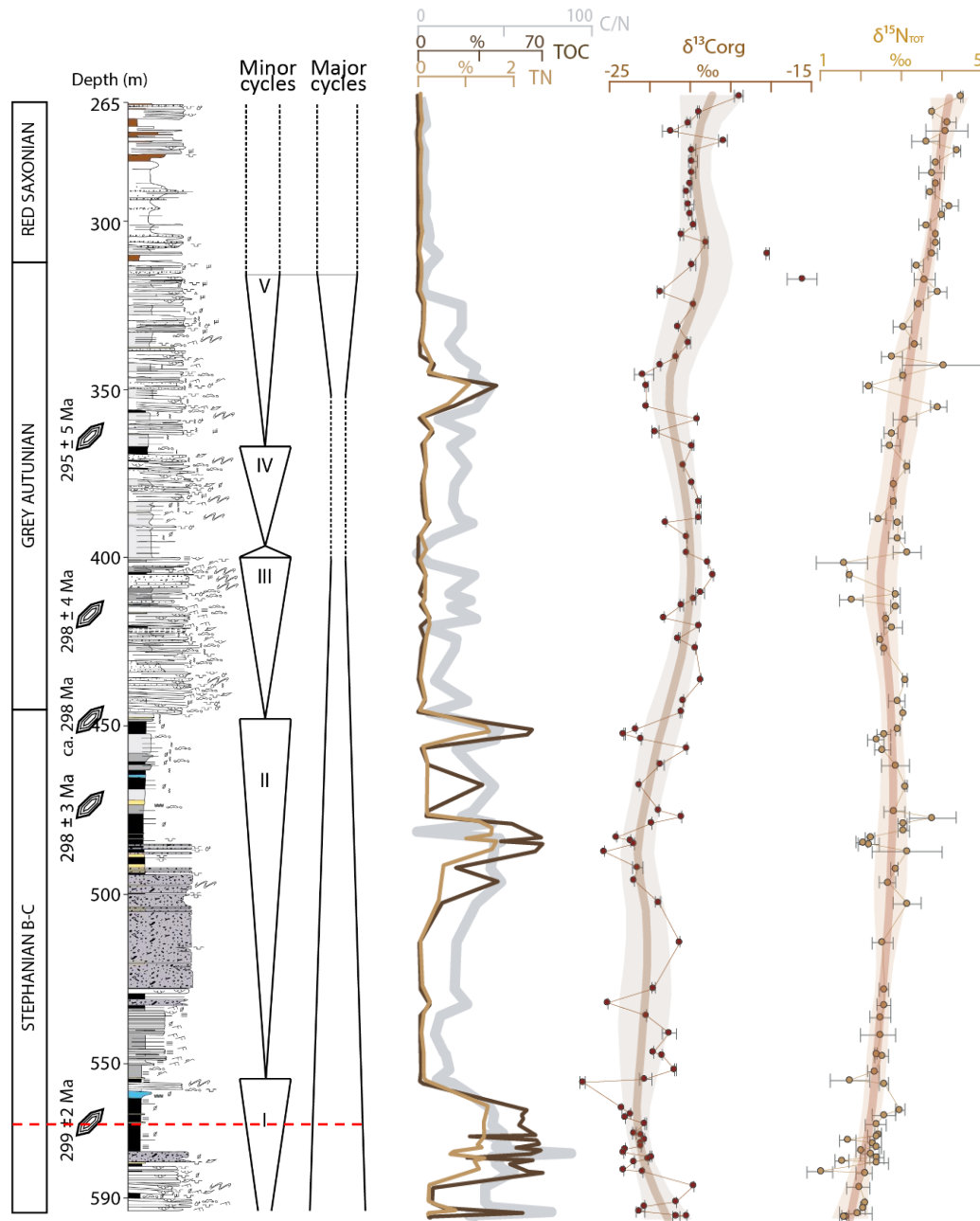
Erosion mécanique

-> Aridité ?

A detailed diorama of a prehistoric forest. The scene is filled with lush green ferns and other ancient plants. Several large, textured tree trunks are visible, some with reddish-brown bark. In the foreground, there are fallen logs and more dense vegetation. A large dragonfly is perched on a log in the middle ground. The background shows a misty, dense forest of tall trees. The word "GÉOCHIMIE" is written in white, bold, sans-serif capital letters across the center of the image.

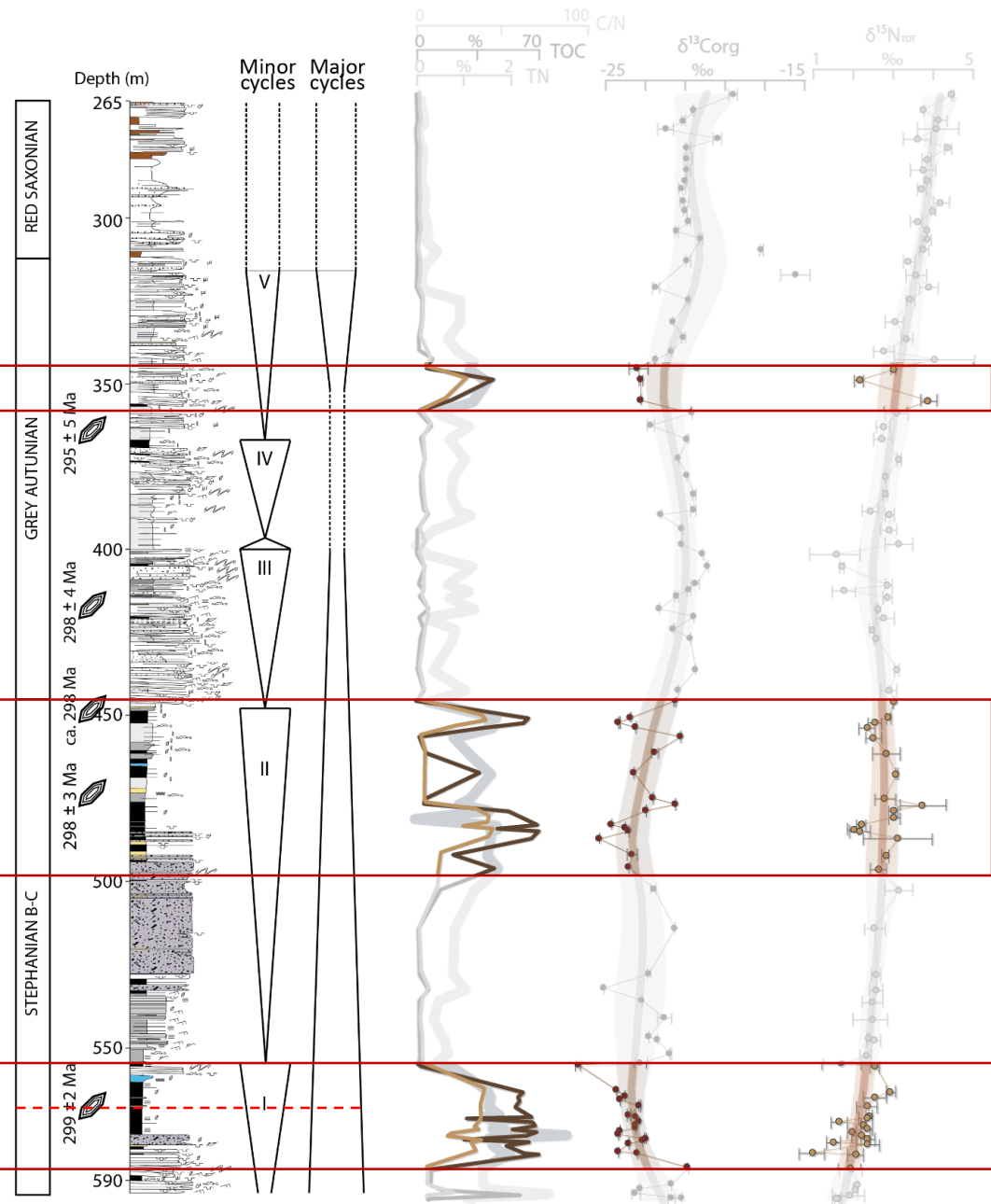
GÉOCHIMIE

GÉOCHIMIE – LY-F



Géochimie organique :

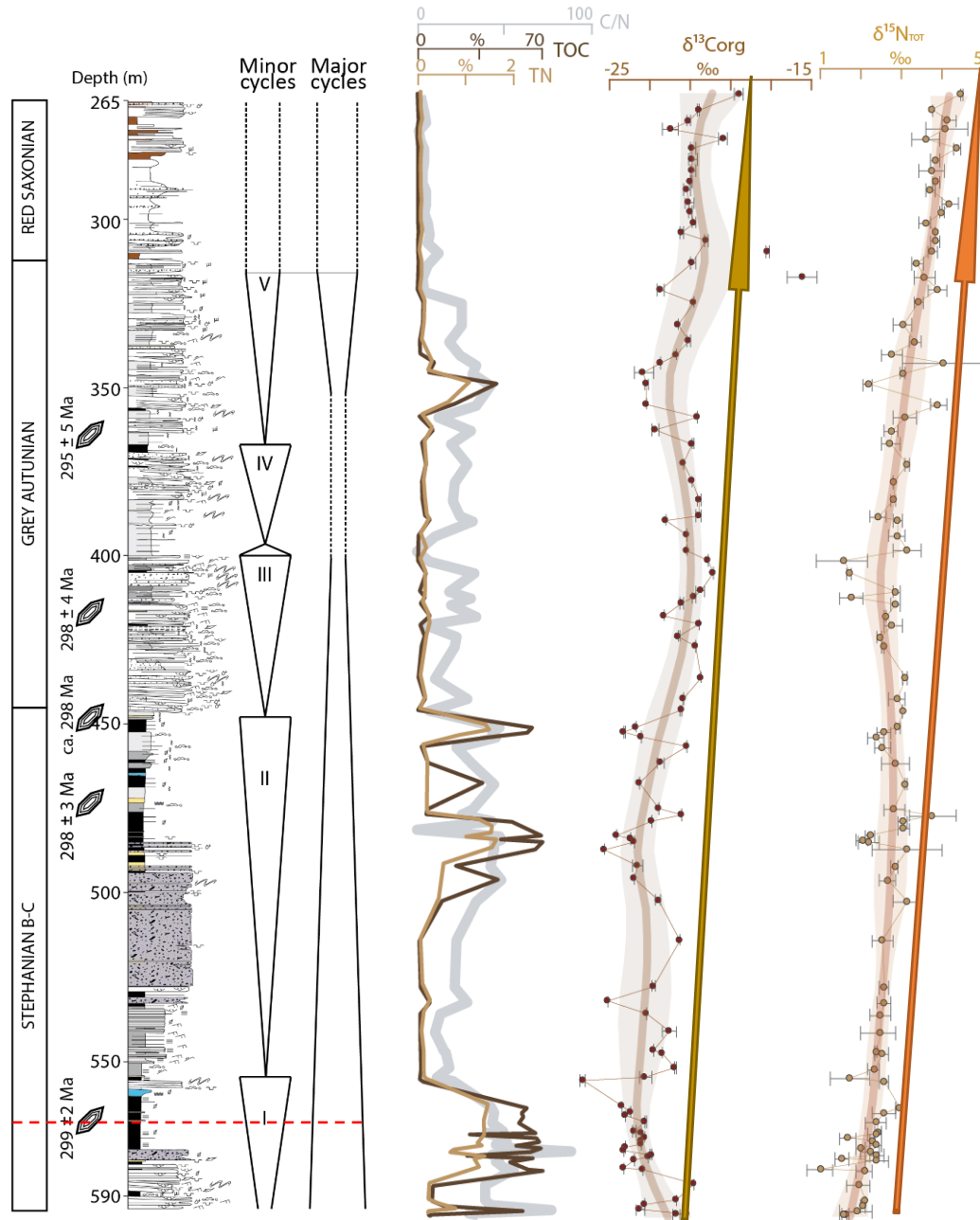
Préservation et type de matière organique



LY-F :

- ✓ Composition élémentaire variant avec le type d'environnement
- ✓ OM Type III (terrestre)
Ou mélange avec Type II (algair)

GÉOCHIMIE – LY-F



✓ Variations à long terme

> Modifications géodynamiques de grande échelle?

Conclusions et Perspectives

- Meilleures contraintes sur la minéralogie et la géochimie
- Intégration sédimentologie – minéralogie – géochimie
- Corrélations intra- et inter-bassins
(sismique, stratigraphie séquentielle, téphrostatigraphie, âges absolus)

Conclusions et Perspectives

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(sismique, stratigraphie séquentielle, téphrostatigraphie, âges absolus)

Variations géodynamiques synchrones ?

Facteurs locaux / globaux ?

MERCI DE VOTRE ATTENTION