

Partie 2

L'HYDROSPHÈRE

I L'origine de l'eau terrestre.

II Les phases et changements de phases

III Les réserves

IV le cycle de l'eau

V La circulation océanique générale

VI Le niveau eustatique, l'insolation et les glaciations du Quaternaire

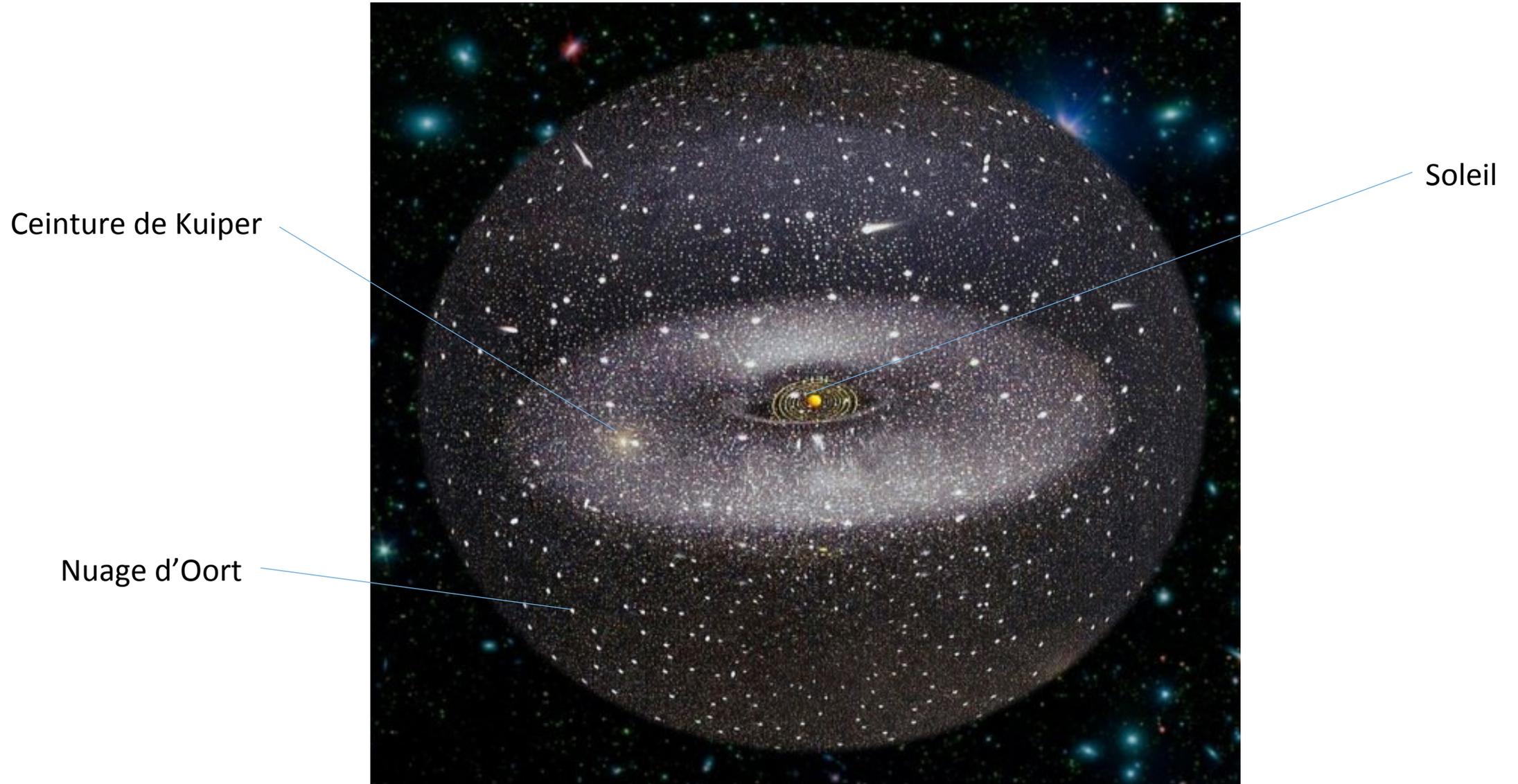
VII Les upwellings

VIII El Niño ou ENSO

IX Les tsunamis

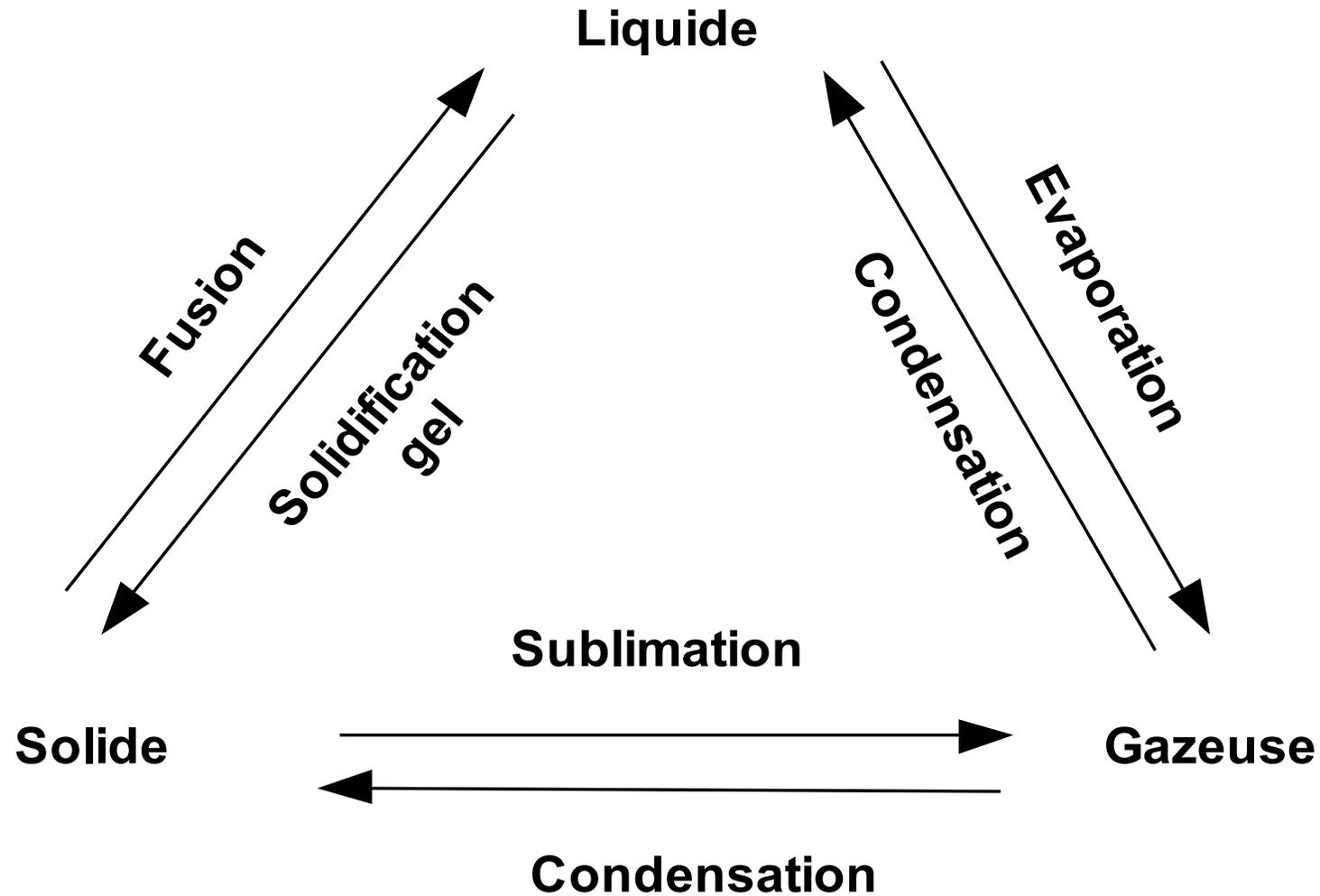
X Les marées

La ceinture de Kuiper et le nuage d'Oort



I L'origine de l'eau terrestre.

Phases et changements de phases de l'eau

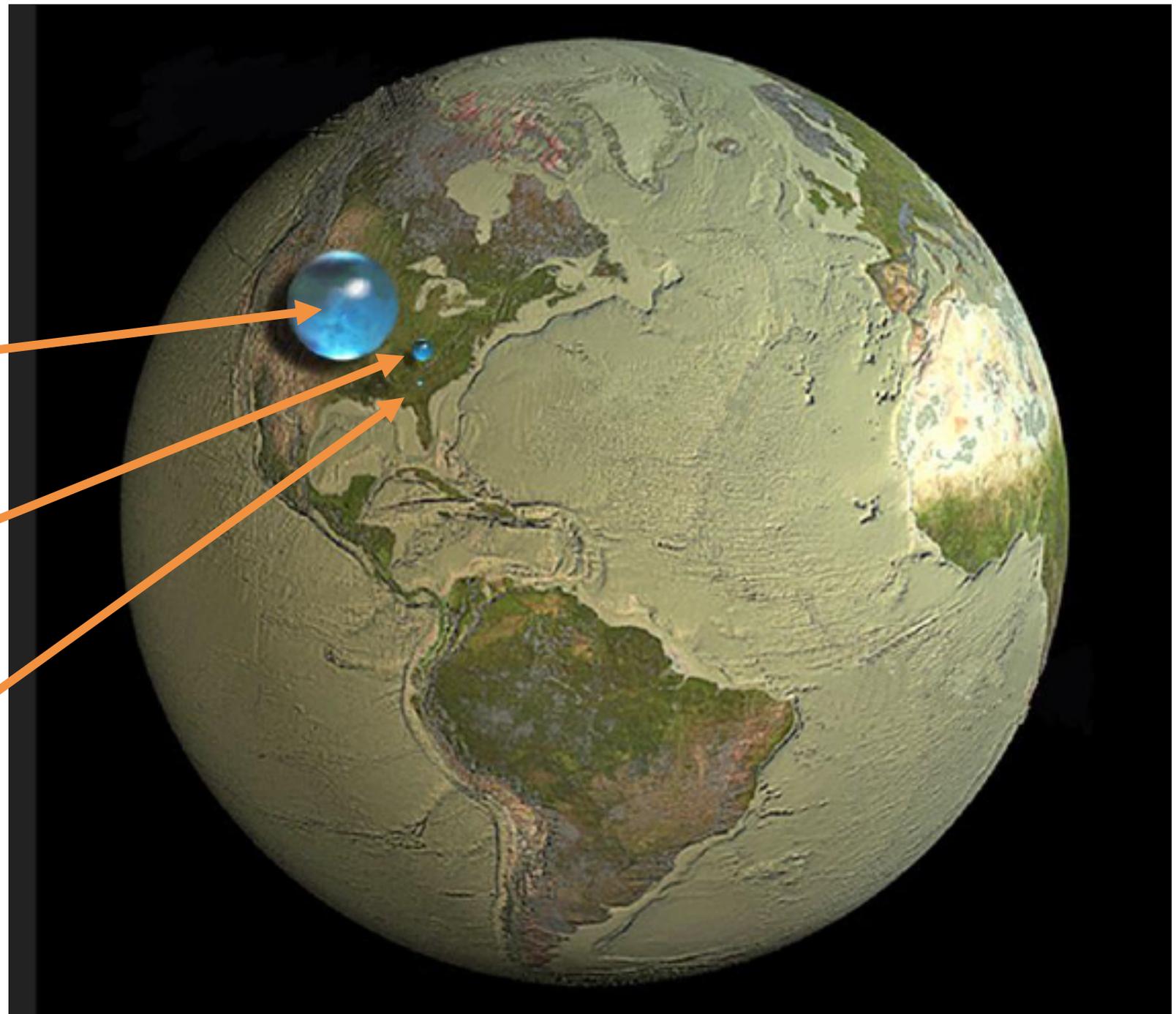


Comparaison des volumes Terre/eau

Eau salée

Eau douce totale

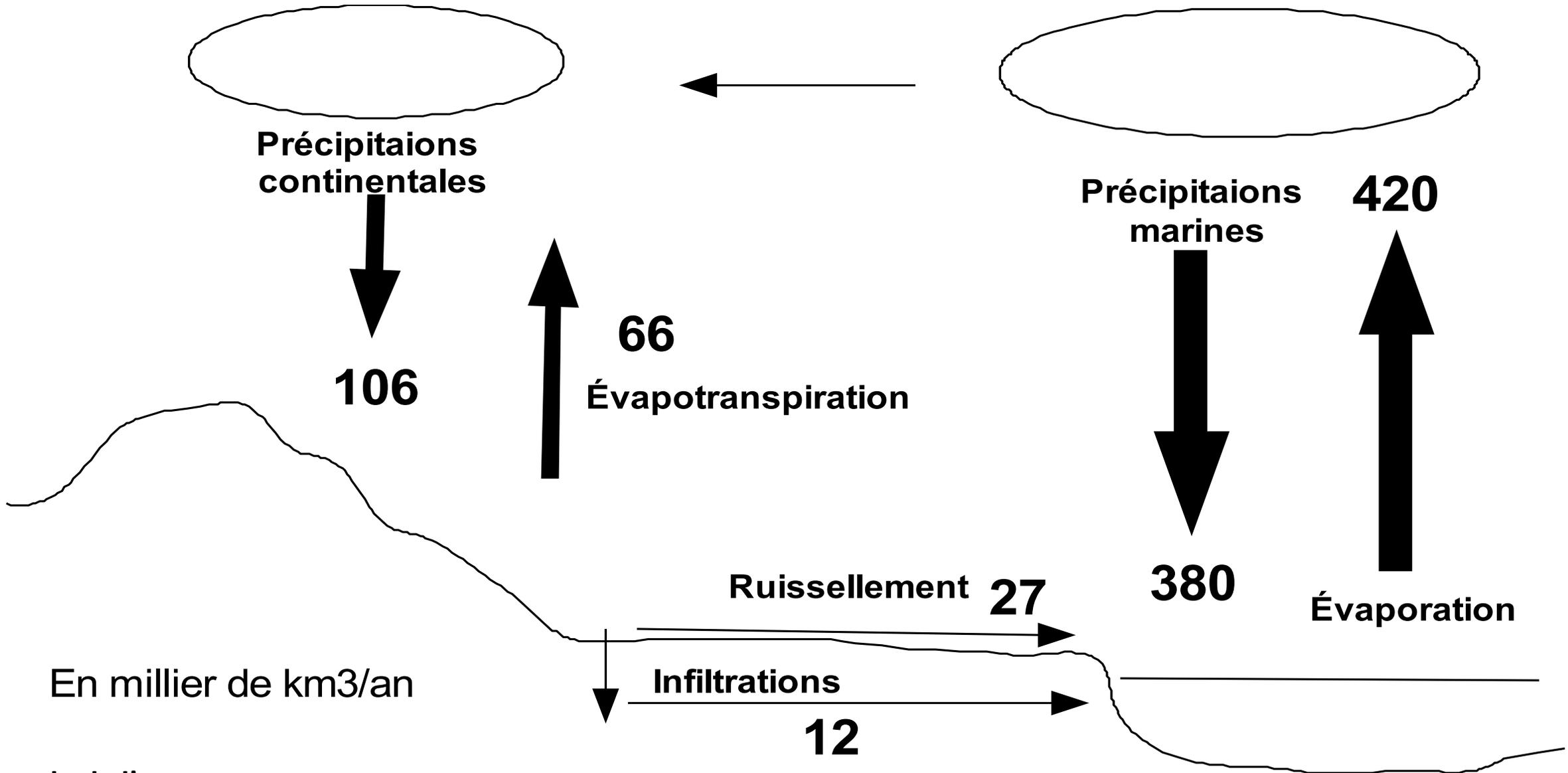
Eau douce non gelée



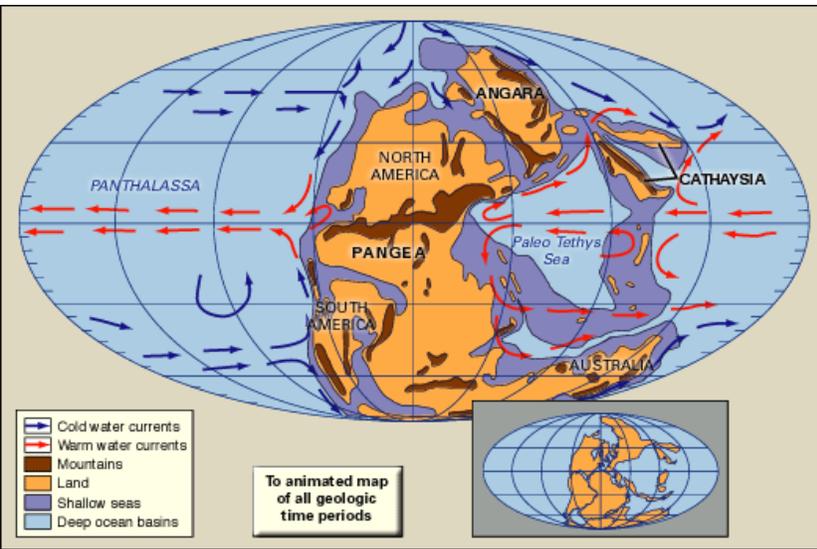
Les Volume d'eau sur Terre

Réservoir	Ensemble (%)	Eau douce (%)
Océans	97,1	0
Glaces	1,7	59,9
Eaux souterraines très superficielles	1,2	39,9
Eaux de surface	0,01	0,2
Atmosphère	0,001	0,3
Eau biologique	0,0001	0,003

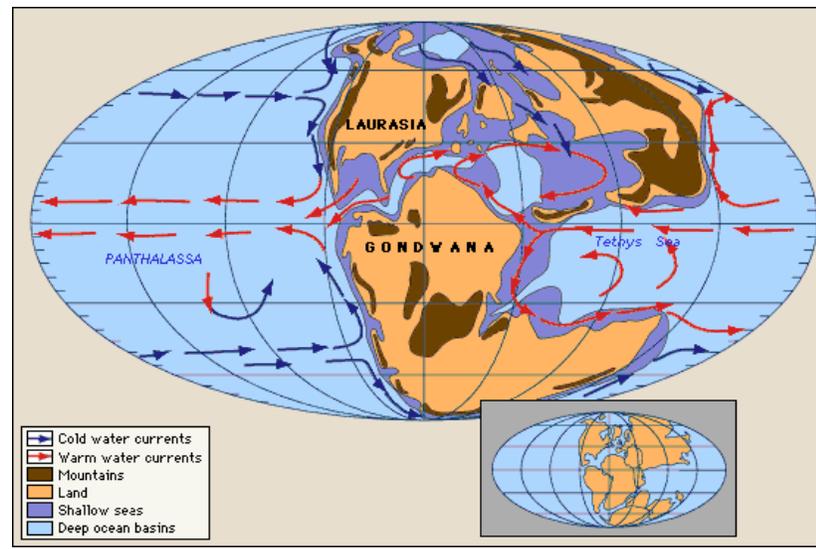
Le cycle de l'eau



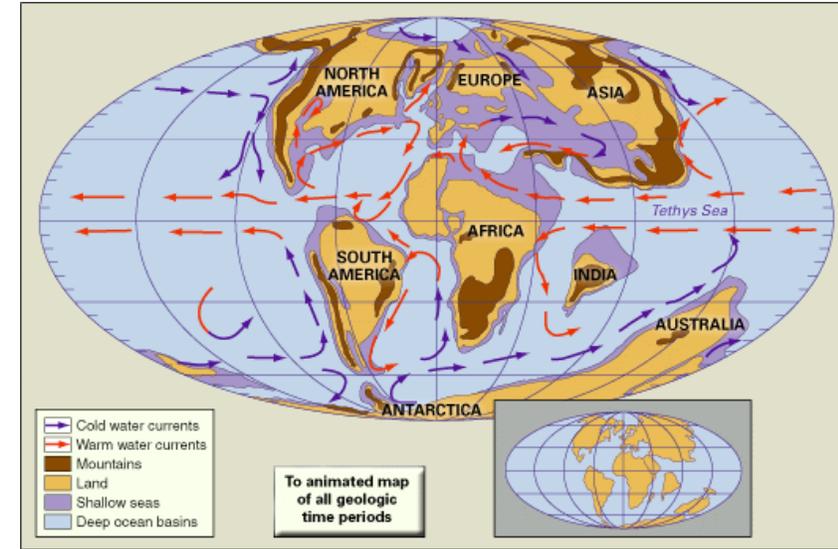
Les paléo-circulations océaniques



Permien ≈ 250 Ma



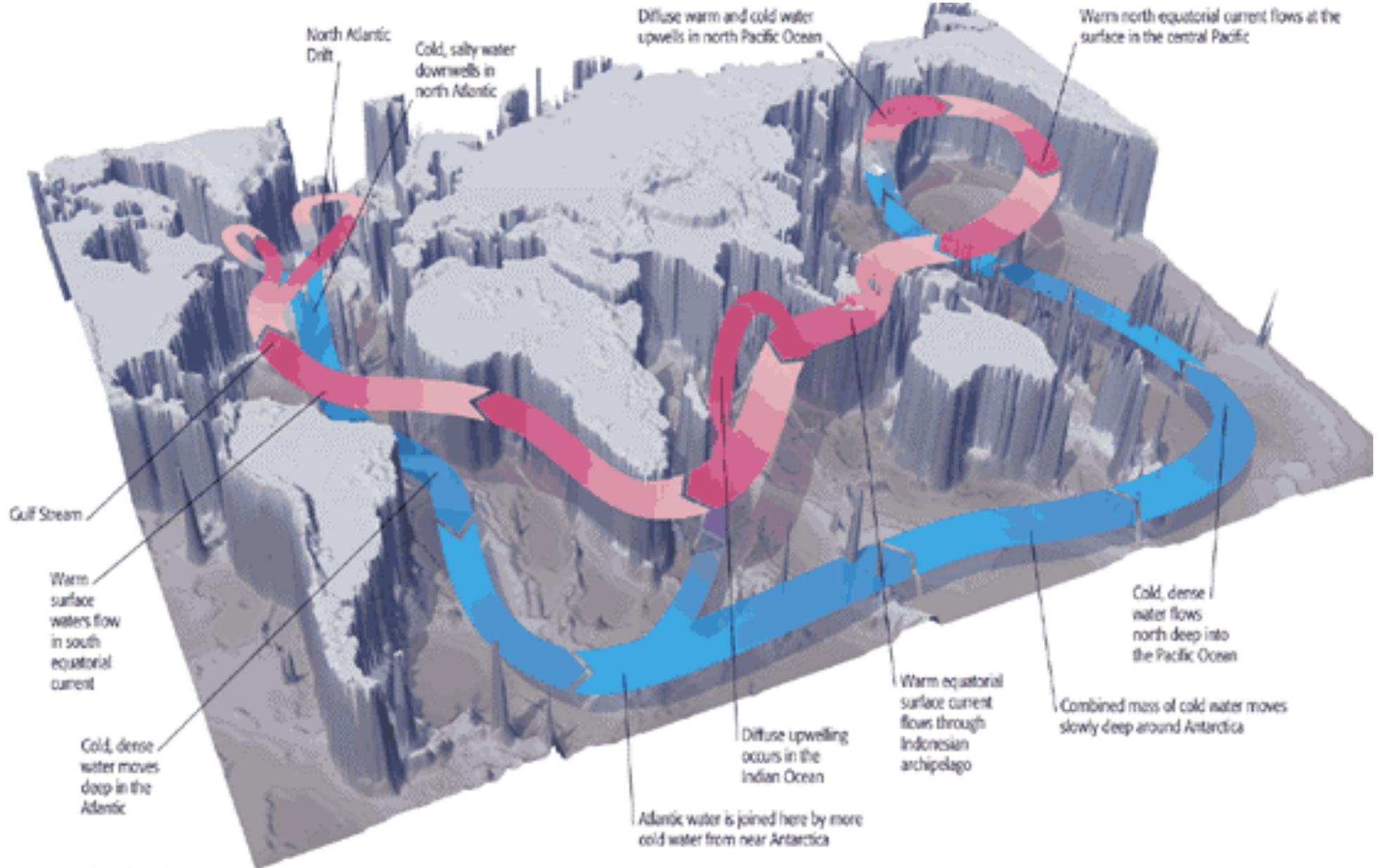
Jurassique ≈ 150 Ma



Fin Crétacé ≈ 70 Ma

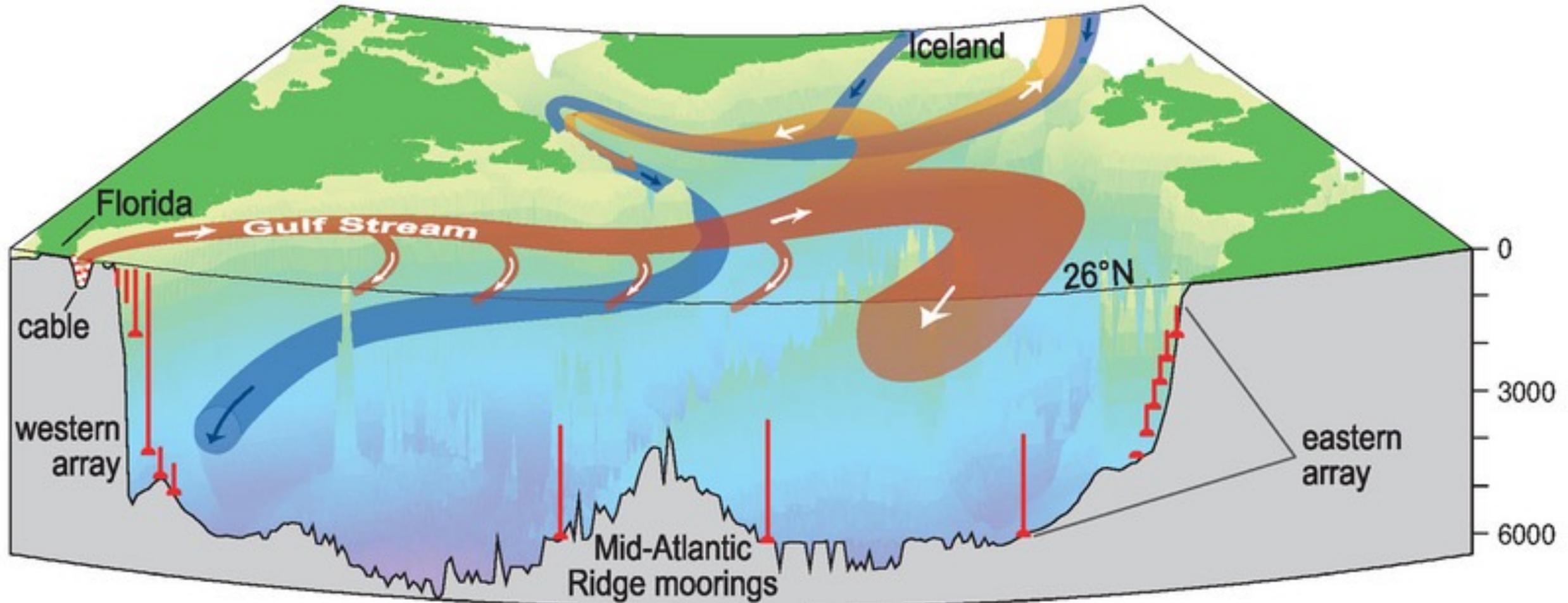
La circulation océanique générale actuelle : La circulation thermohaline

L'échelle des altitudes

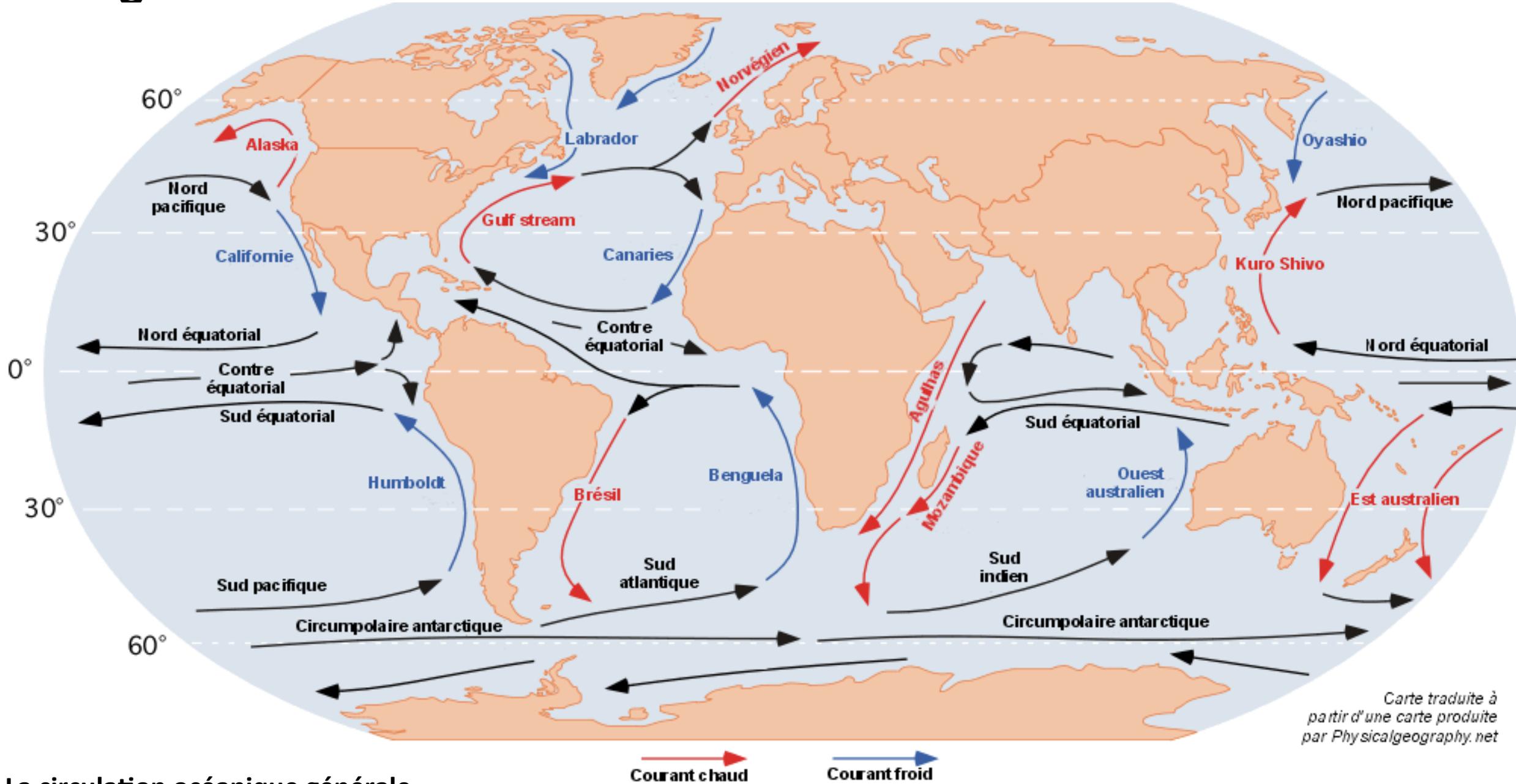


V La circulation océanique générale

2- Les grands courants de surface : Le Gulf Stream



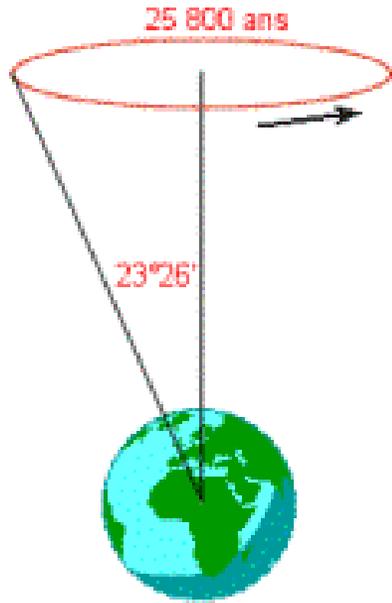
2-Les grands courants de surface



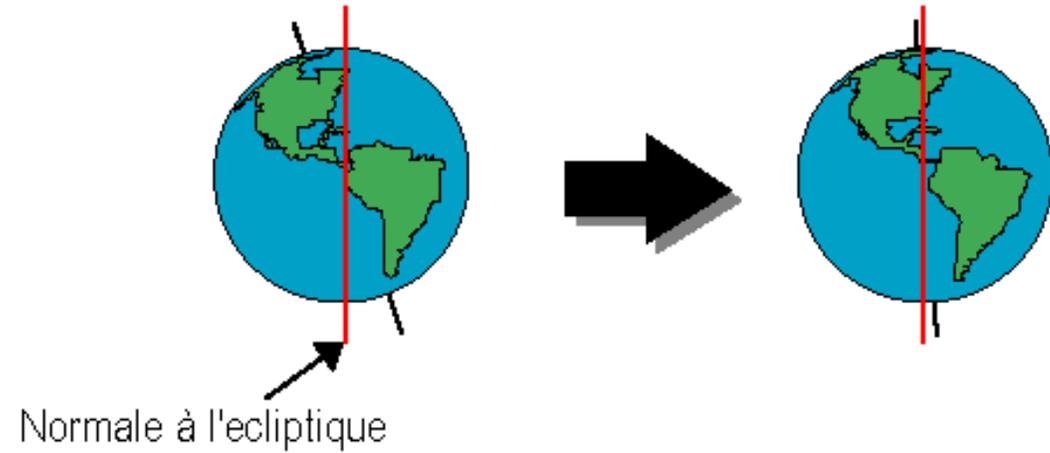
Carte traduite à partir d'une carte produite par Physicalgeography.net

V La circulation océanique générale

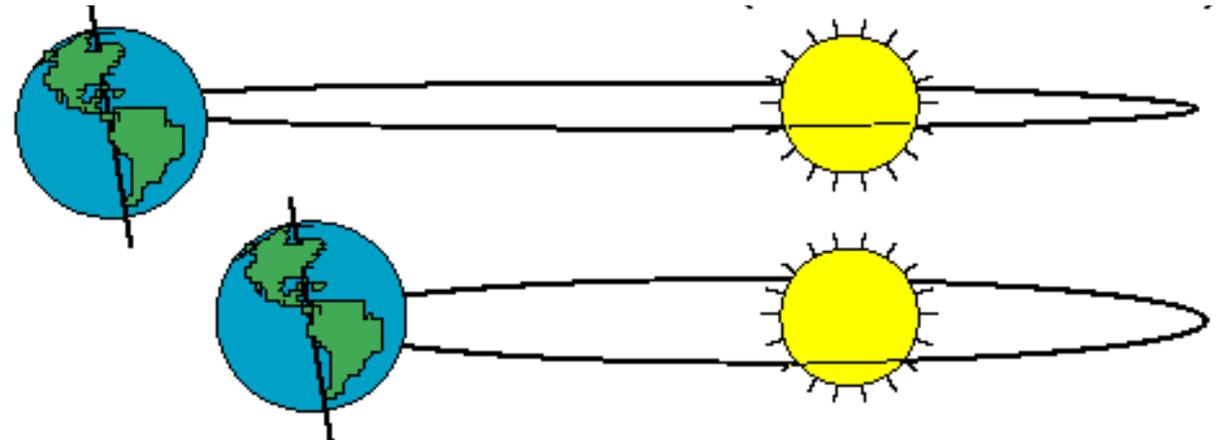
Les paramètres de Milankovič



Précession des équinoxes

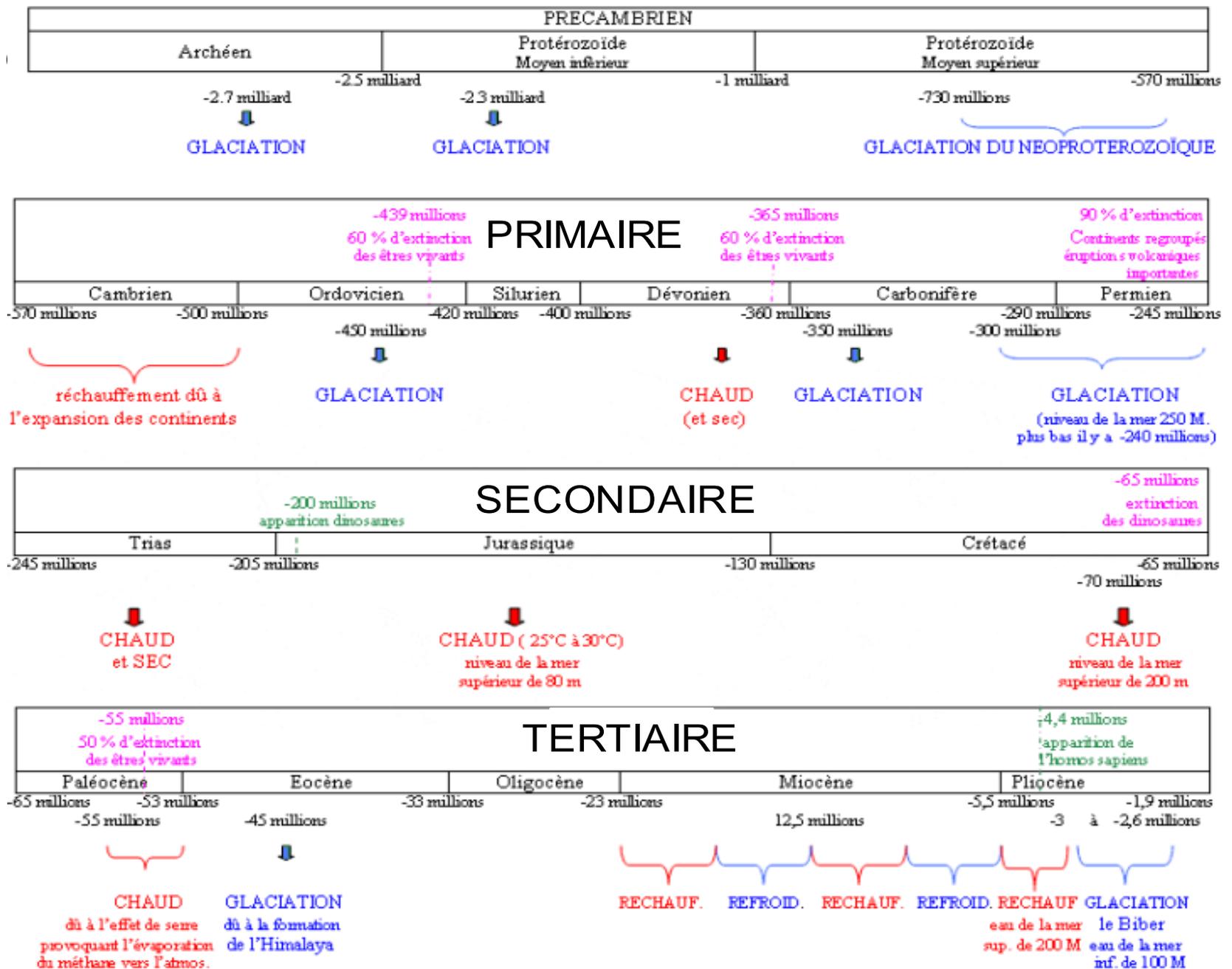


Variation de l'obliquité. 41 000 ans



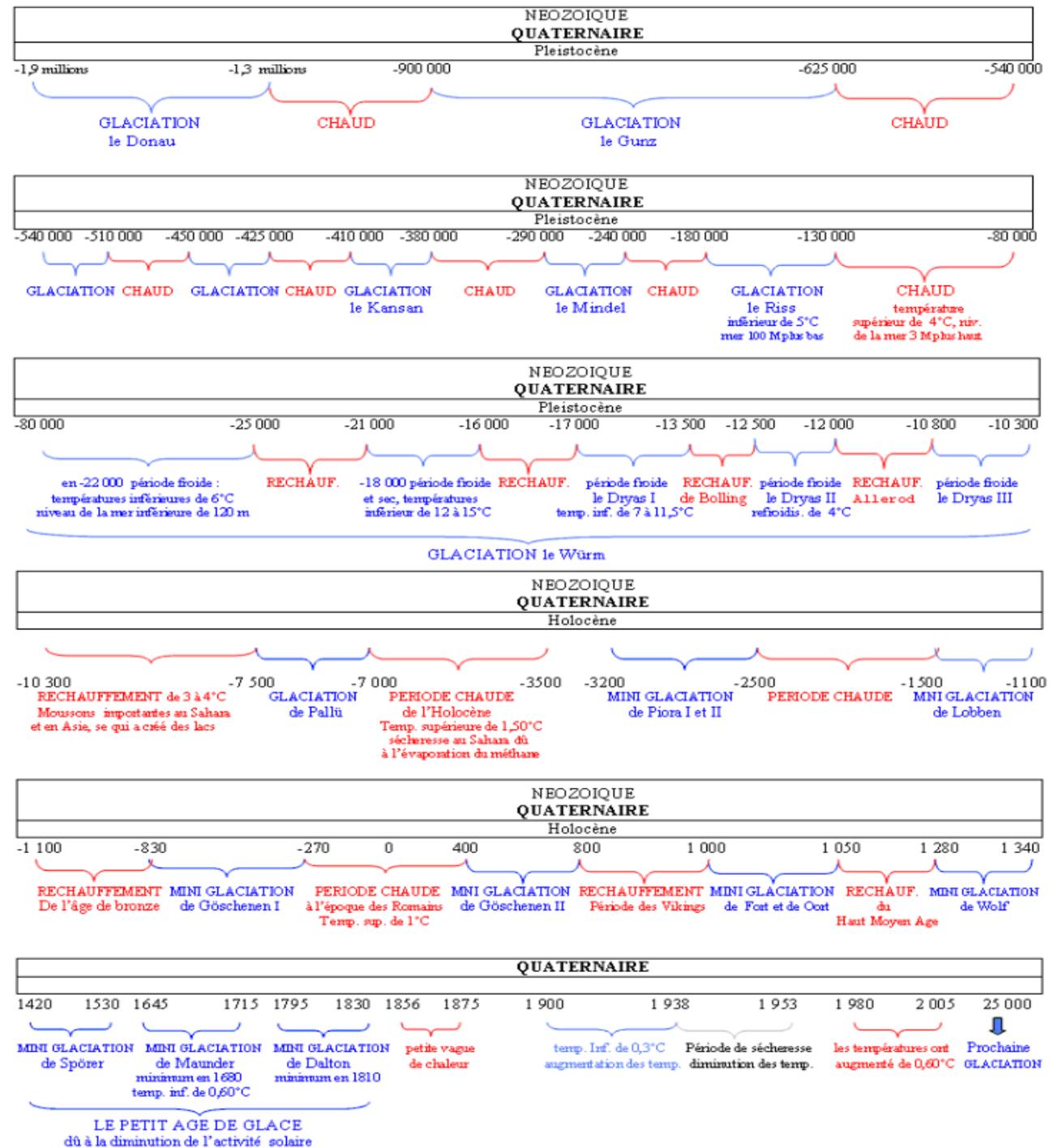
Variation de l'orbite terrestre. 100 000 et 400 000 ans

Episodes glaciaires interglaciaires



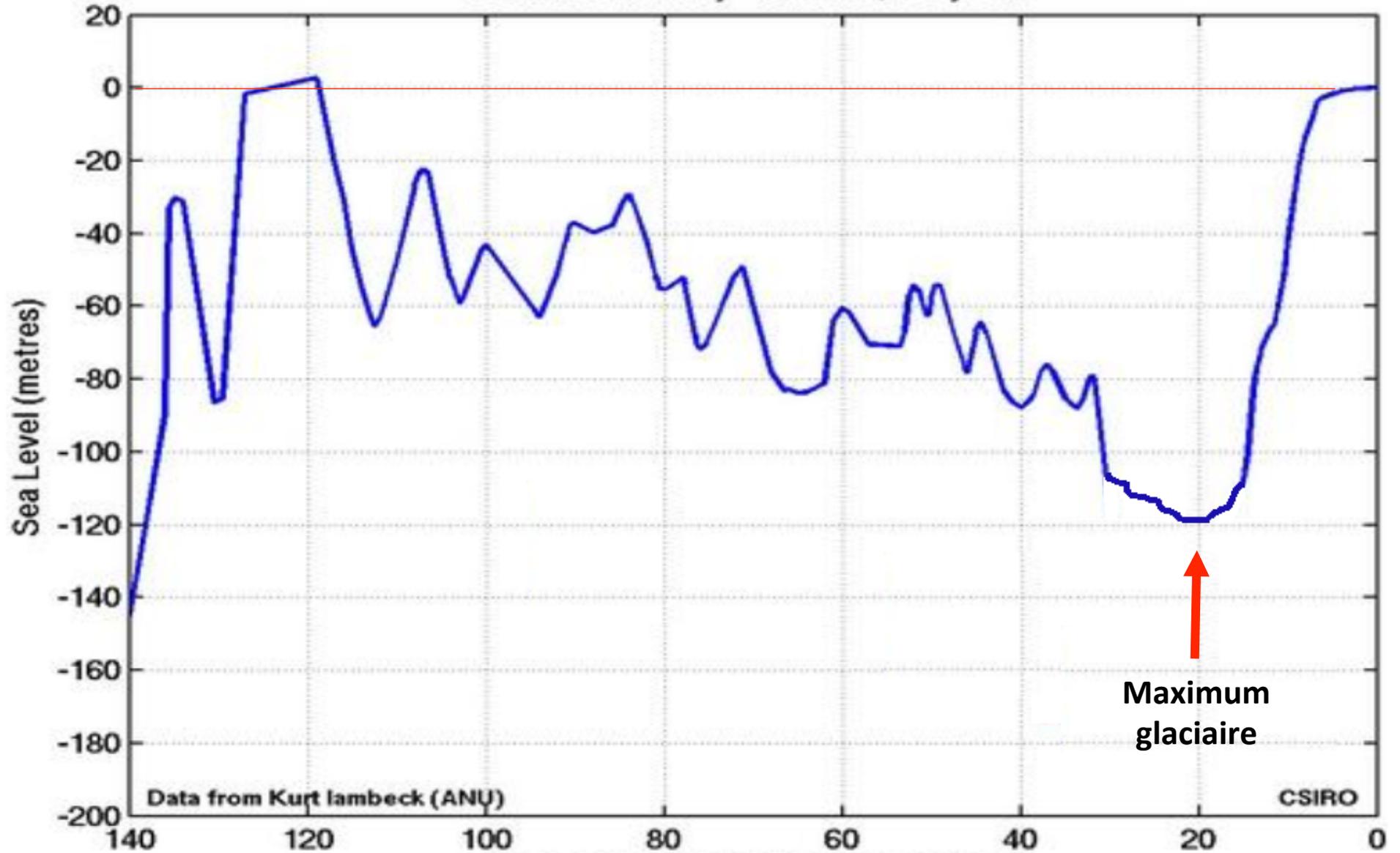
VI Les glaciations, l'insolation et le niveau eustatique

Episodes glaciaires et interglaciaires du quaternaire

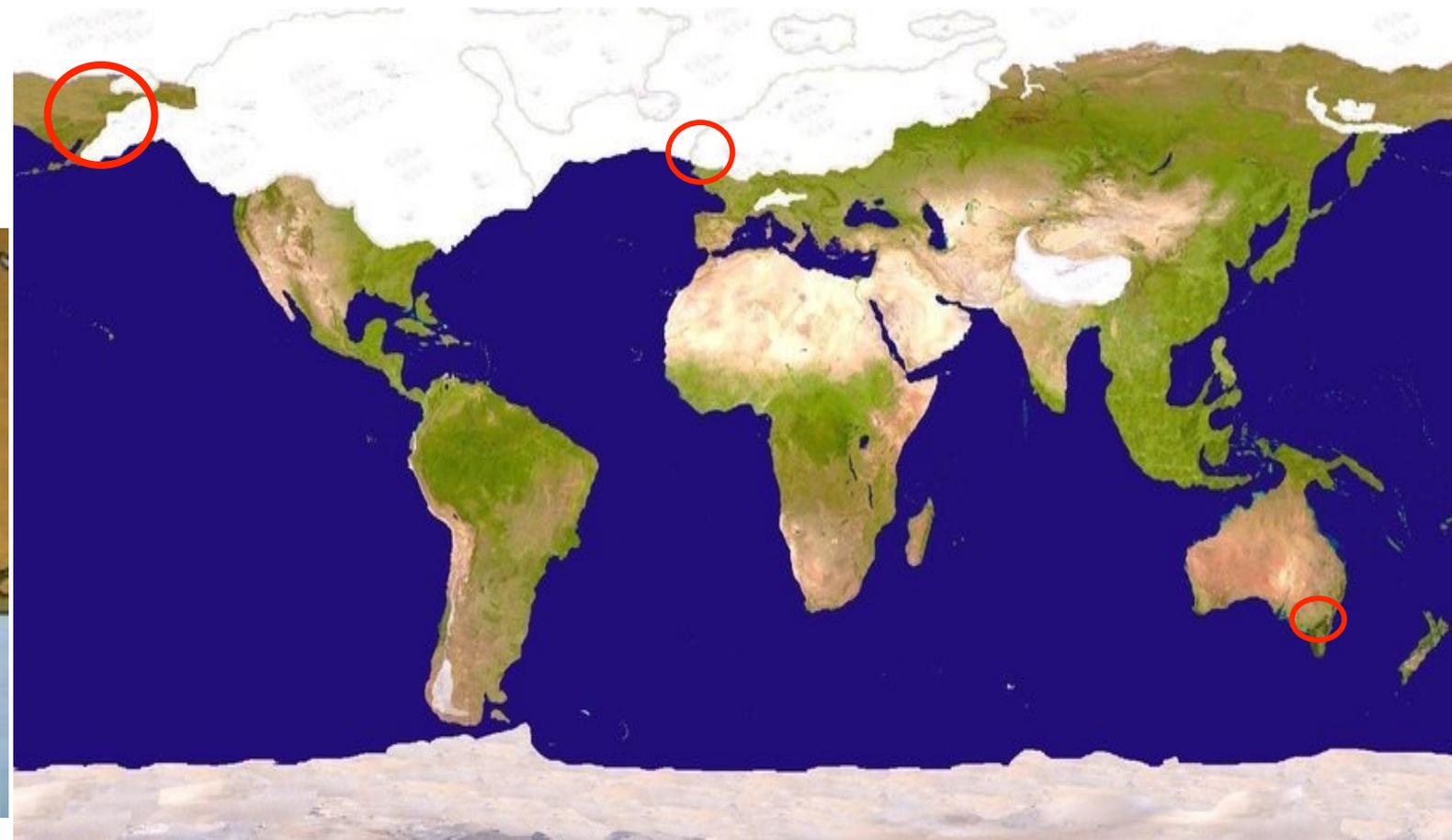


VI Les glaciations, l'insolation et le niveau eustatique

Niveau eustatique mondial depuis 140 000 ans

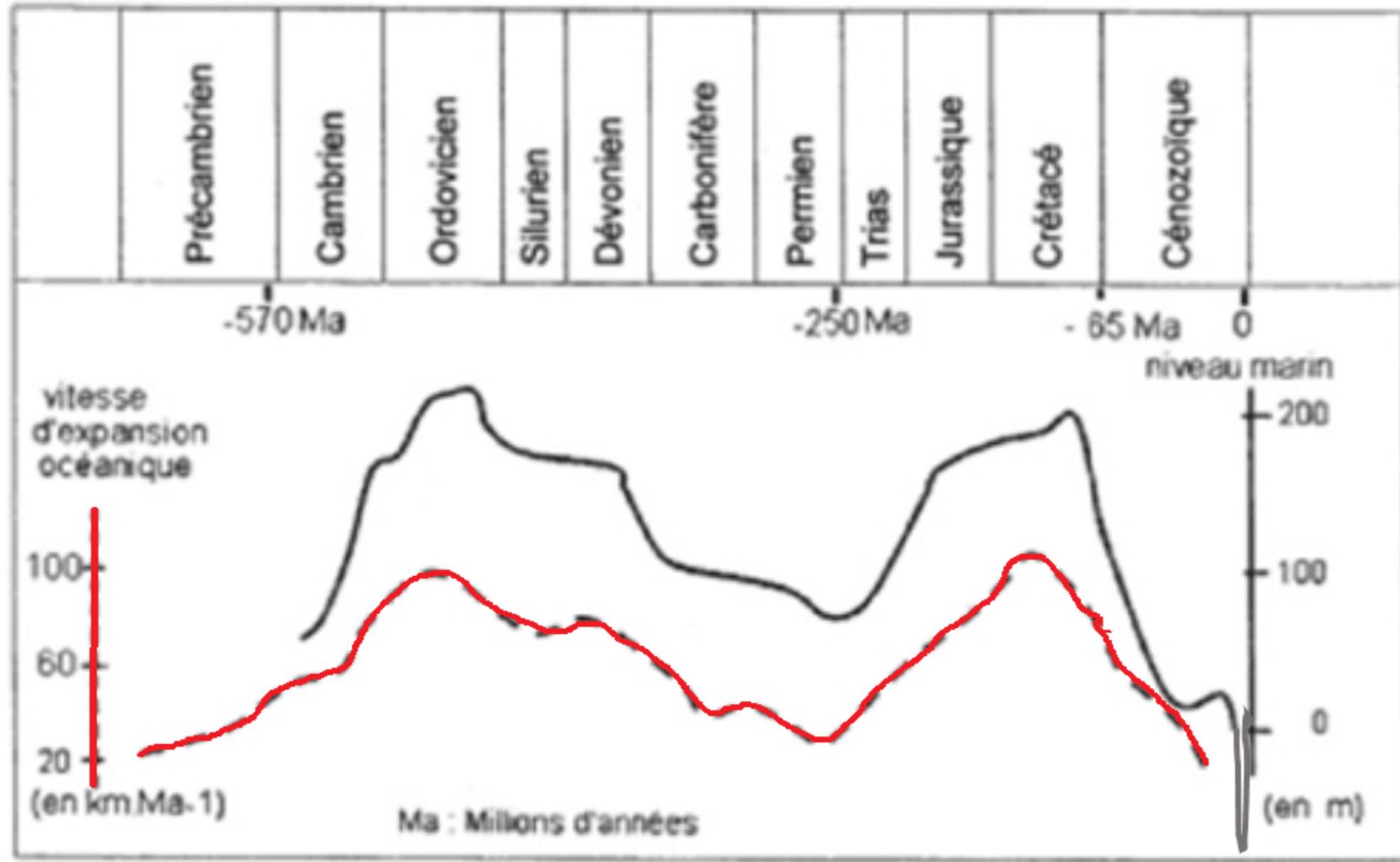


Le détroit de Béring et le Monde lors de la dernière glaciation

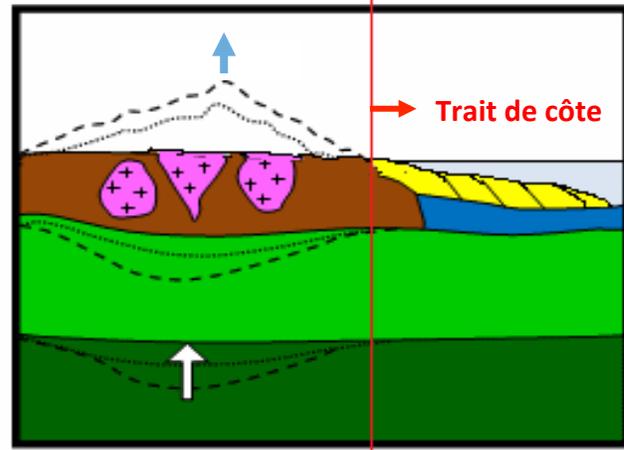
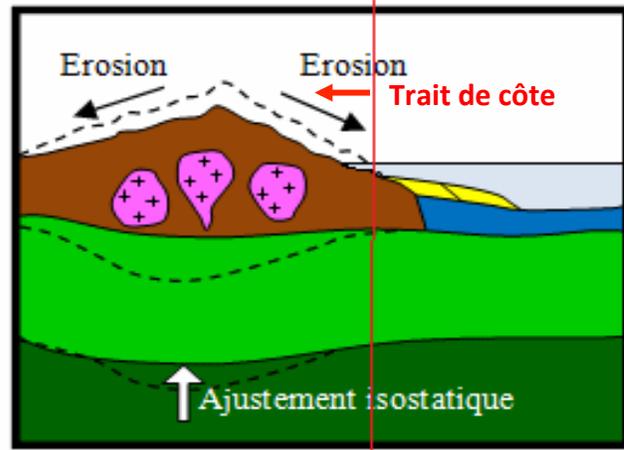
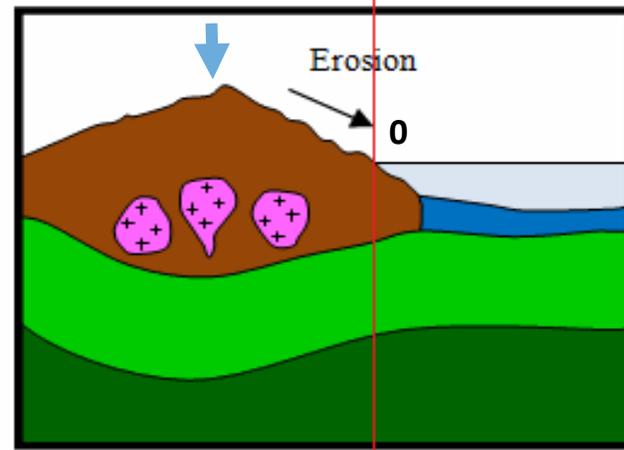


○ : Ponts glaciaires

Les variations du niveau eustatique



Isostasie et trait de côte



 Roches formées en profondeur : pluton de granitoïdes, migmatite et roches métamorphiques (micaschiste, gneiss),

 Sédiments

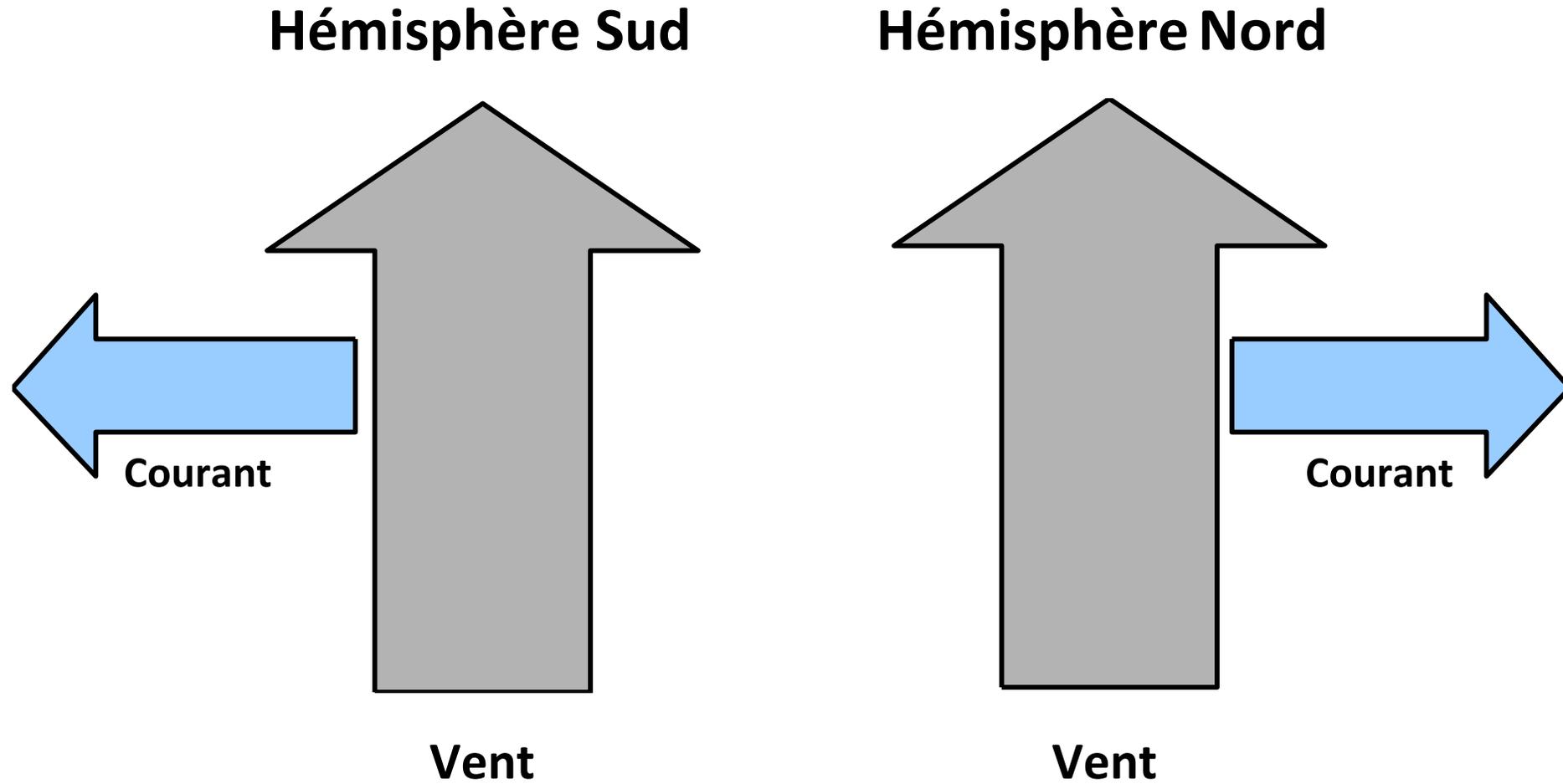
 Croûte continentale

 Croûte océanique

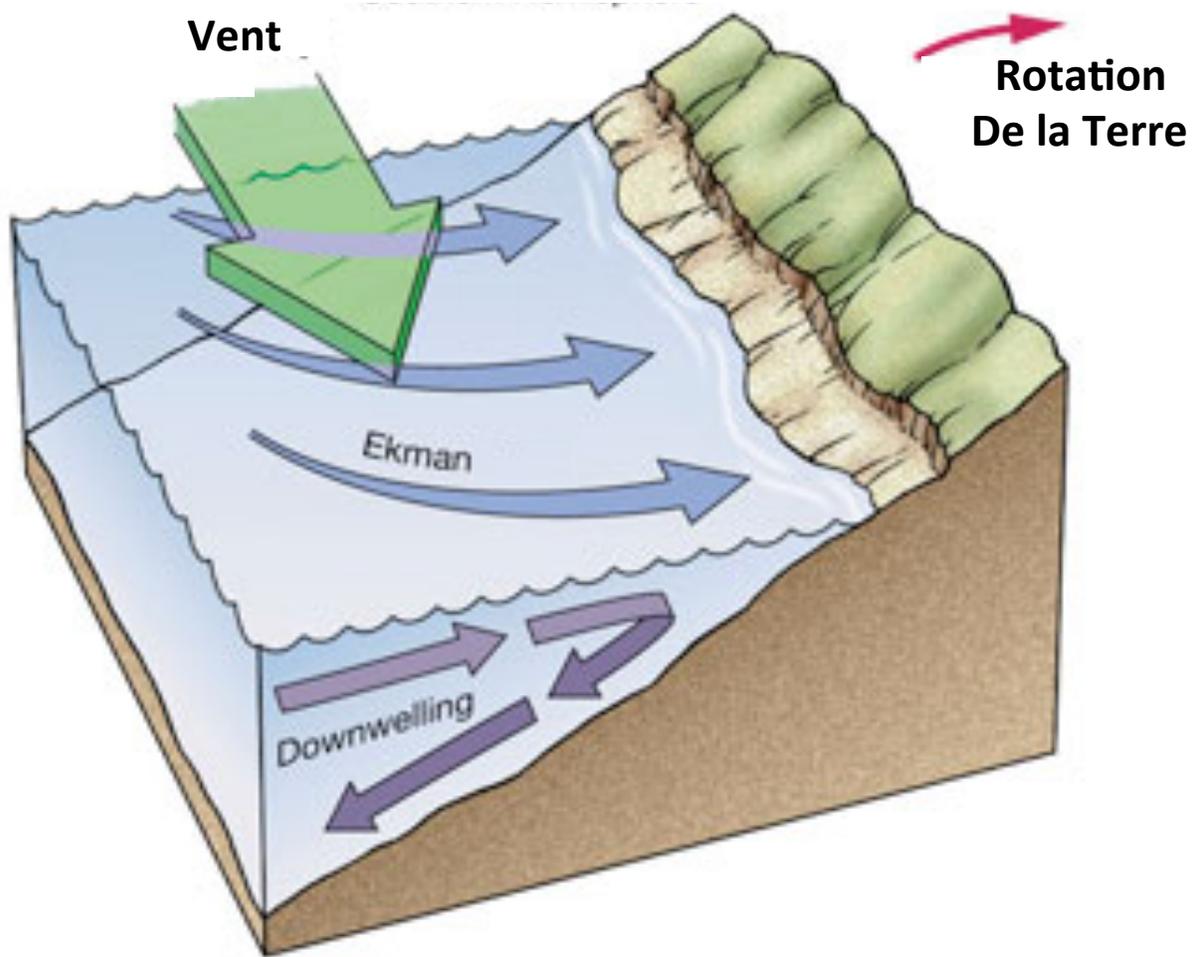
 Manteau asthénosphérique

 Manteau lithosphérique

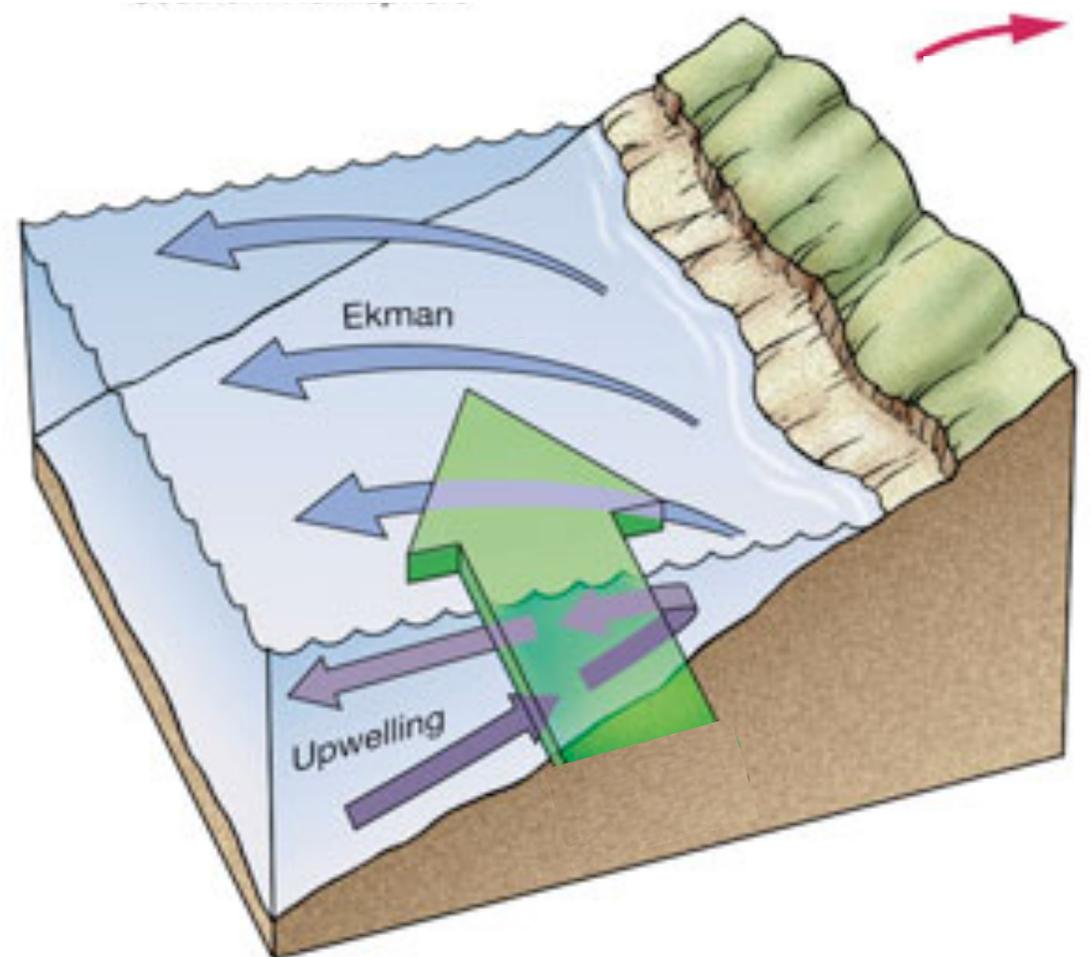
1-Le transport d'Ekman



Downwelling et upwelling dans l'hémisphère sud

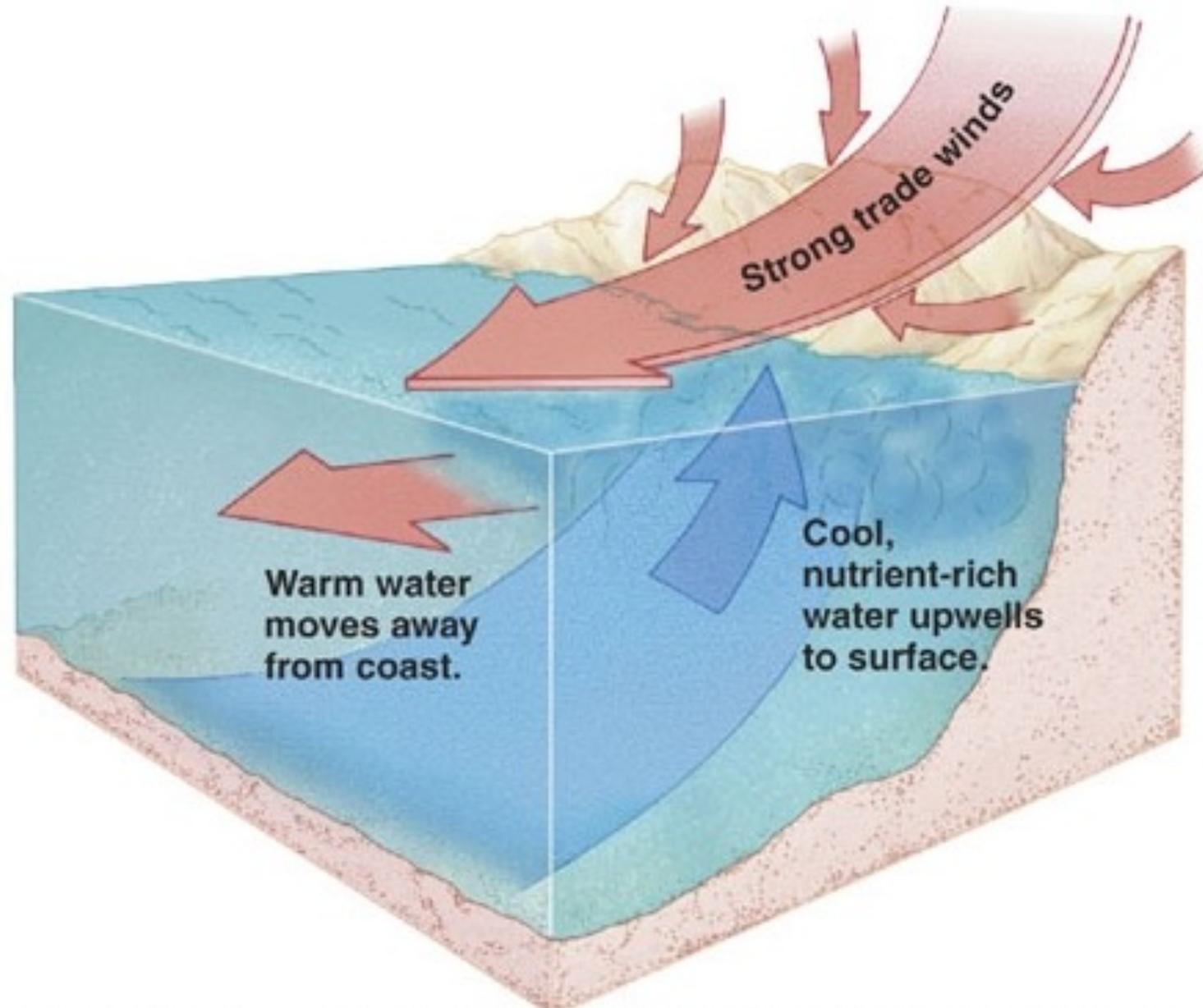


Downwelling

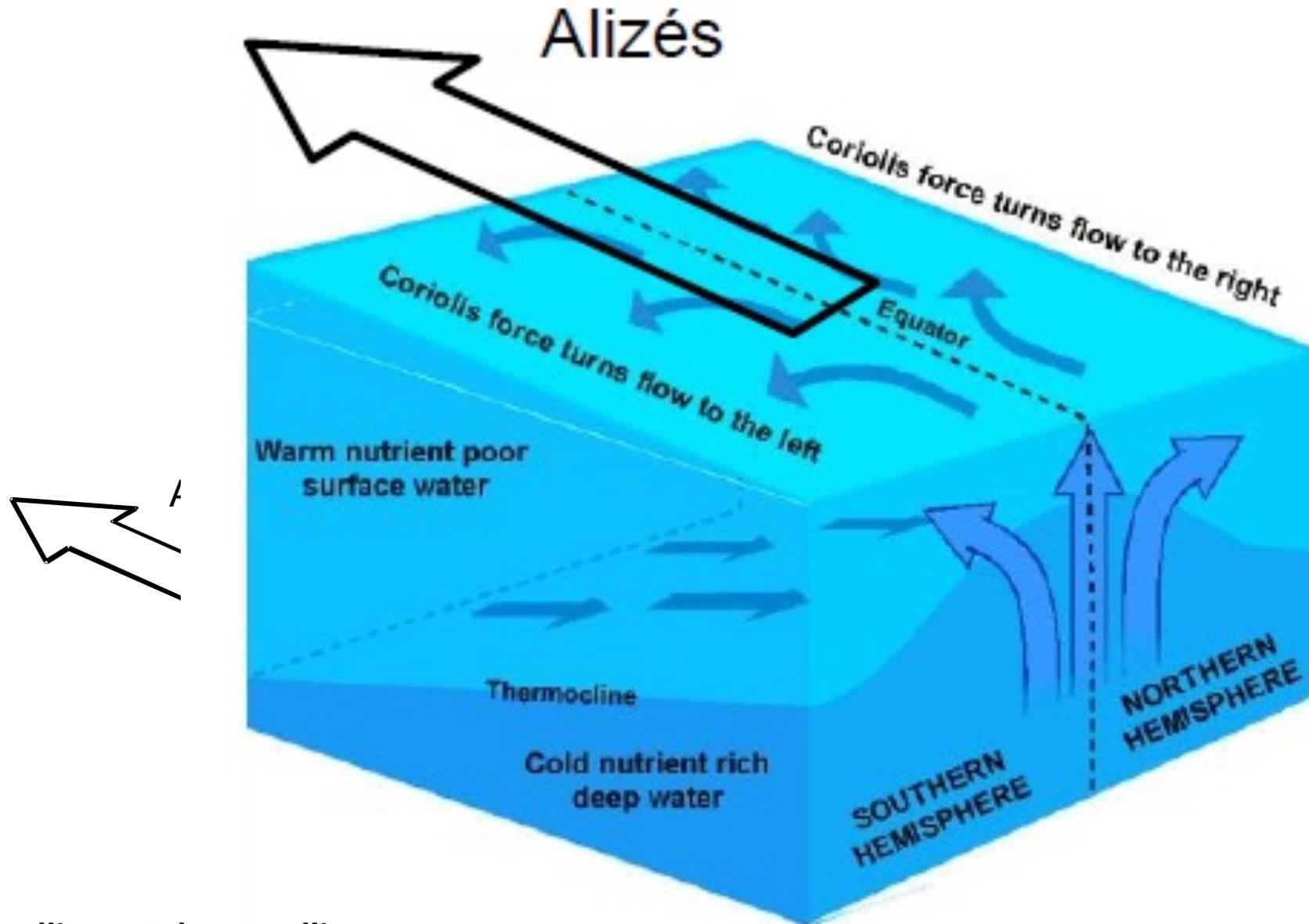


Upwelling

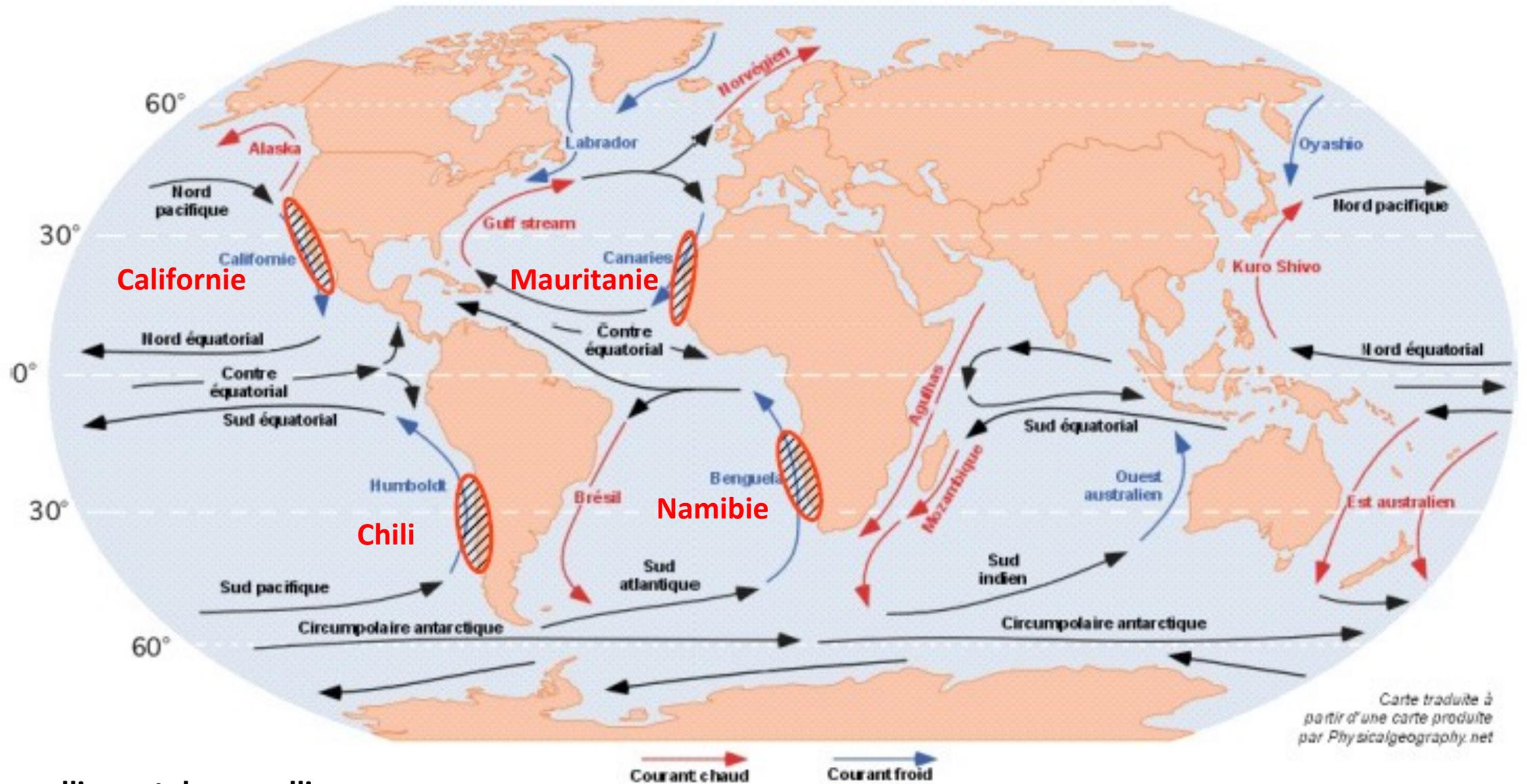
2-Upwelling associé à un vent de terre



3-Upwelling équatorial

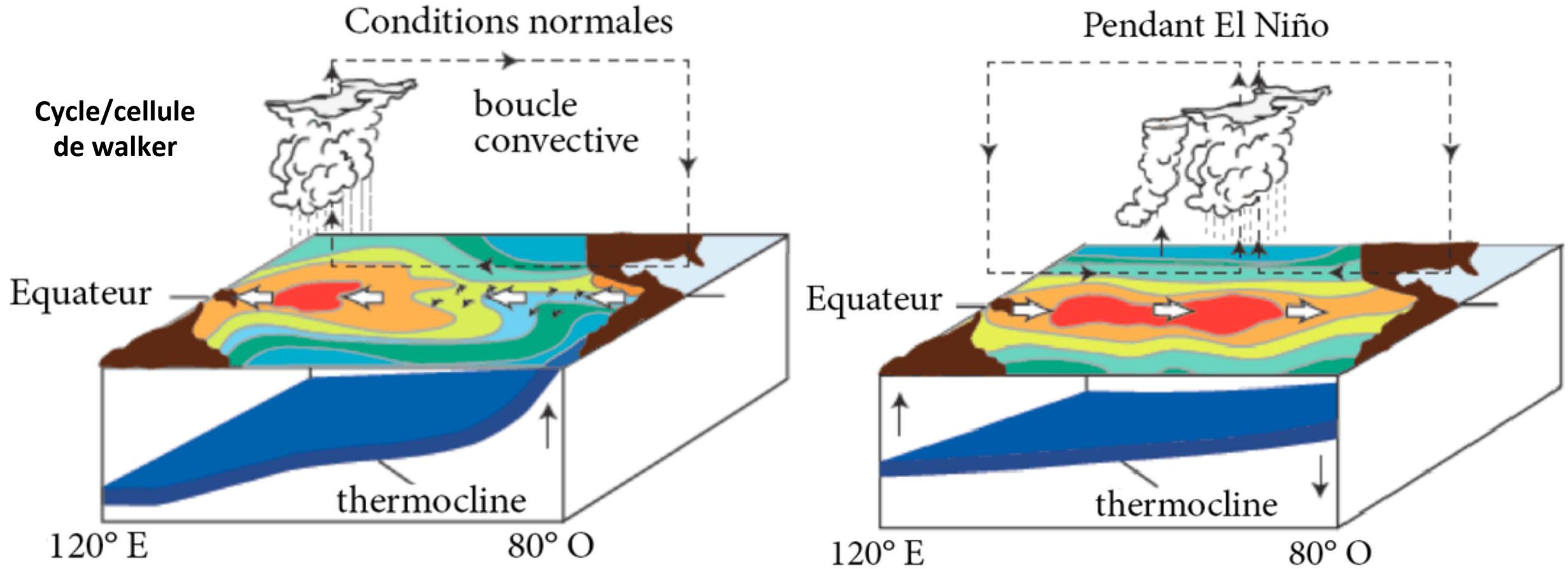


Les grands upwellings

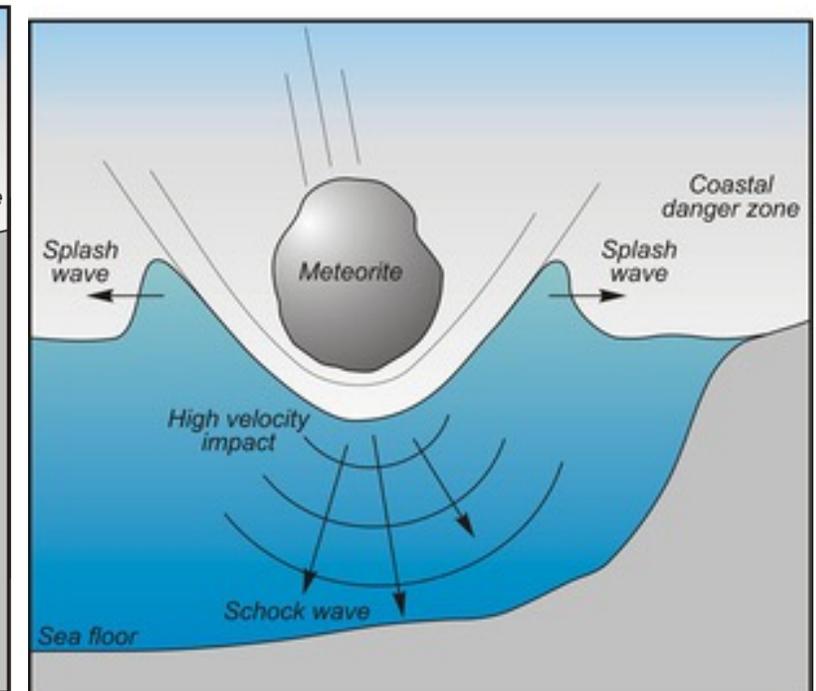
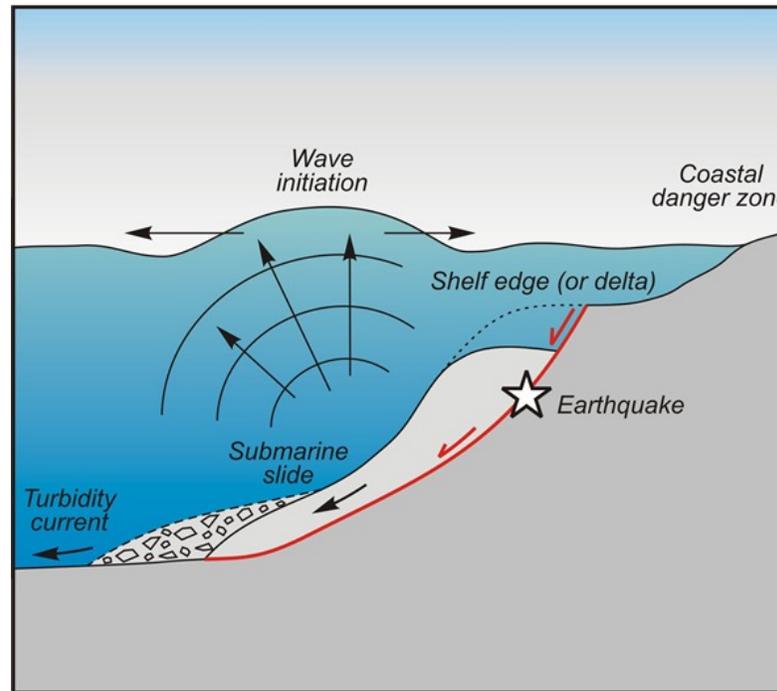
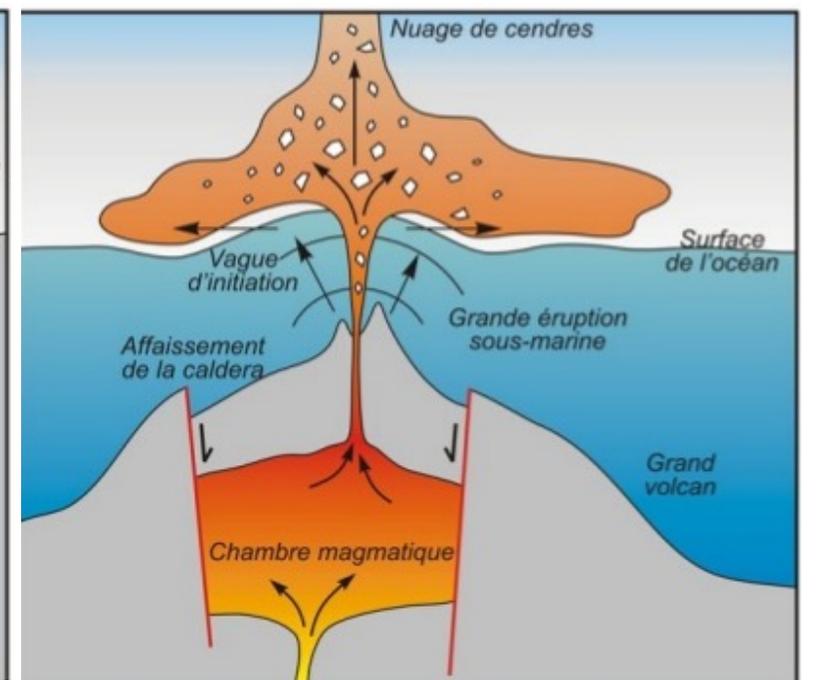
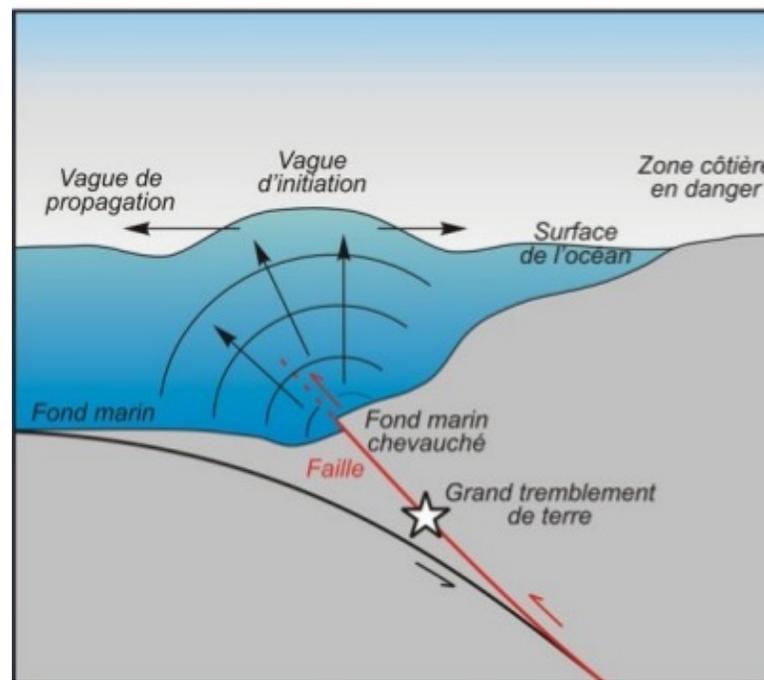


VII Les upwellings et downwellings

El Niño ou ENSO (El Niño-Southern Oscillation)

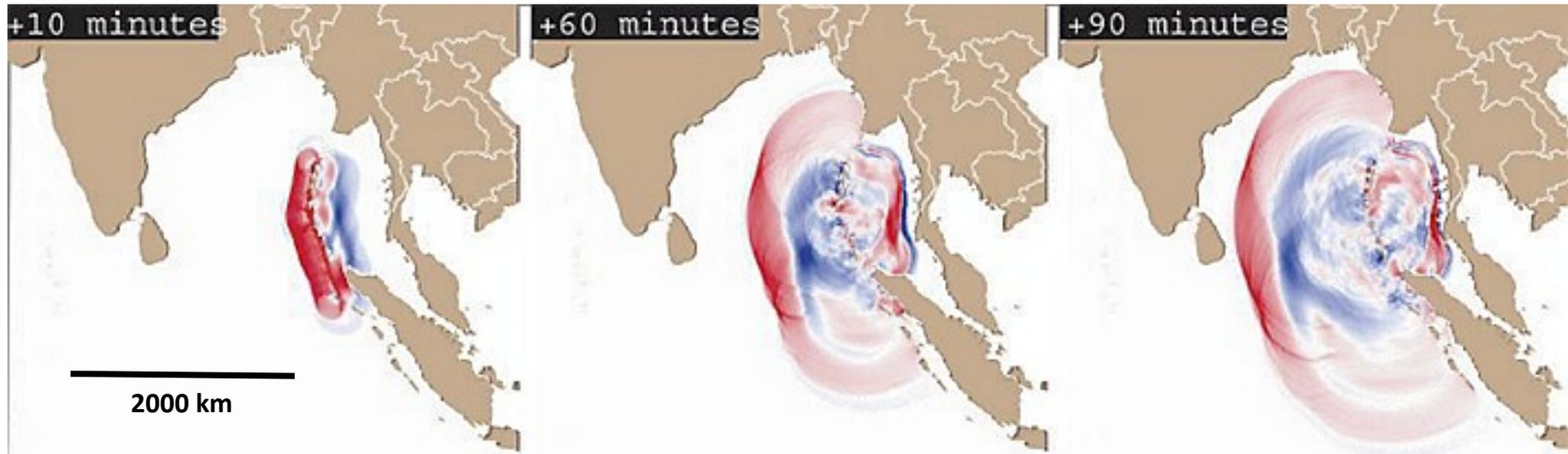


1-Les causes des tsunamis

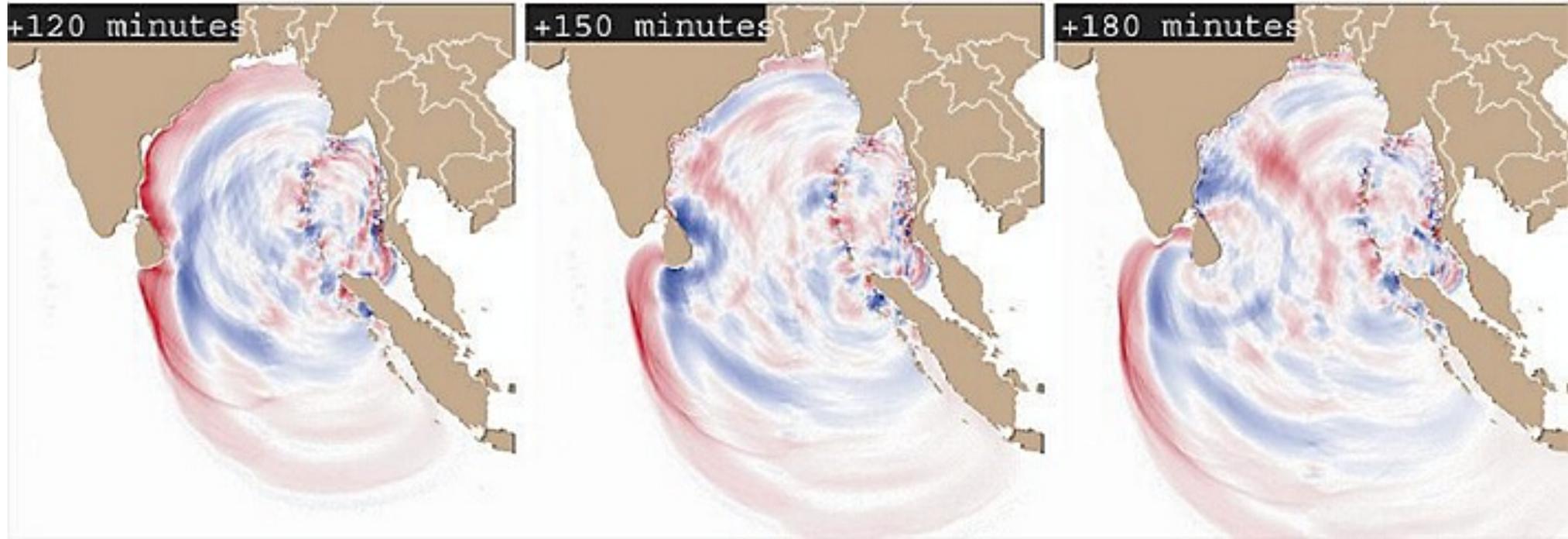


2-Vitesse des tsunamis

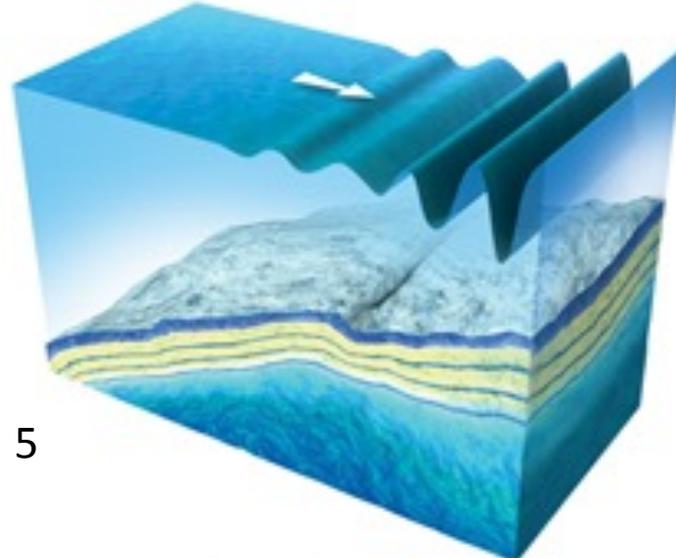
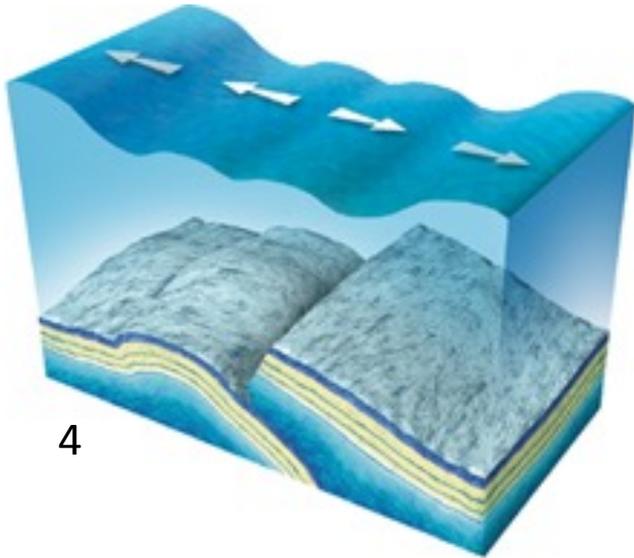
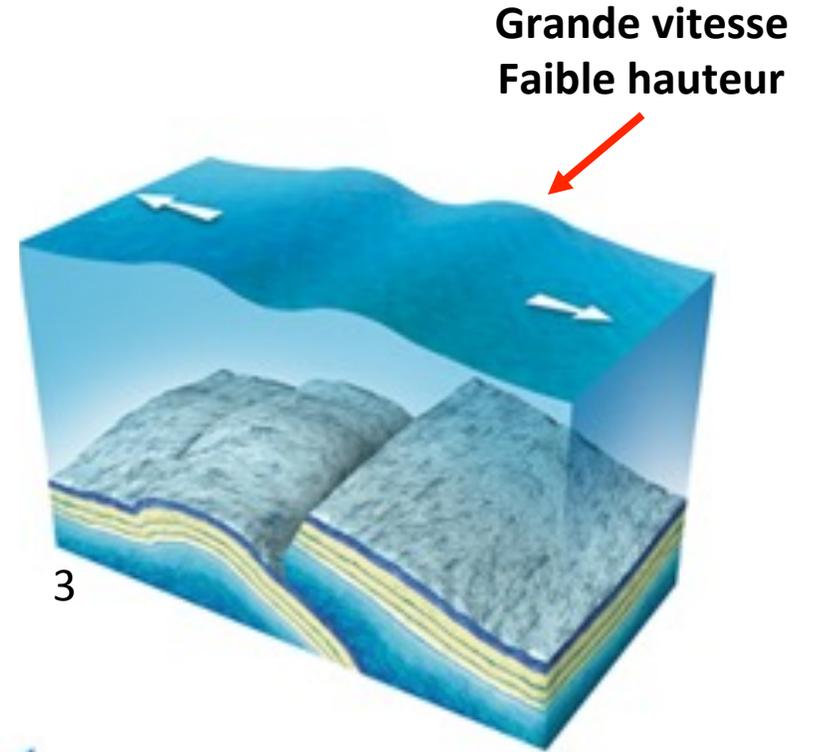
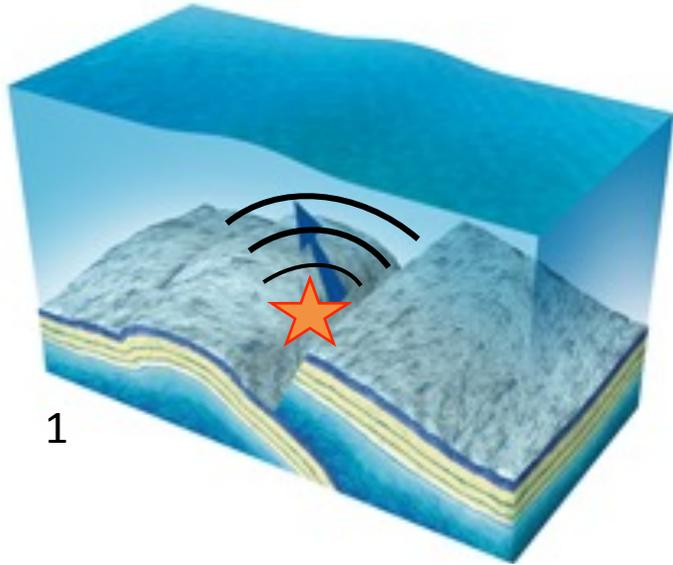
Sumatra
12/2004



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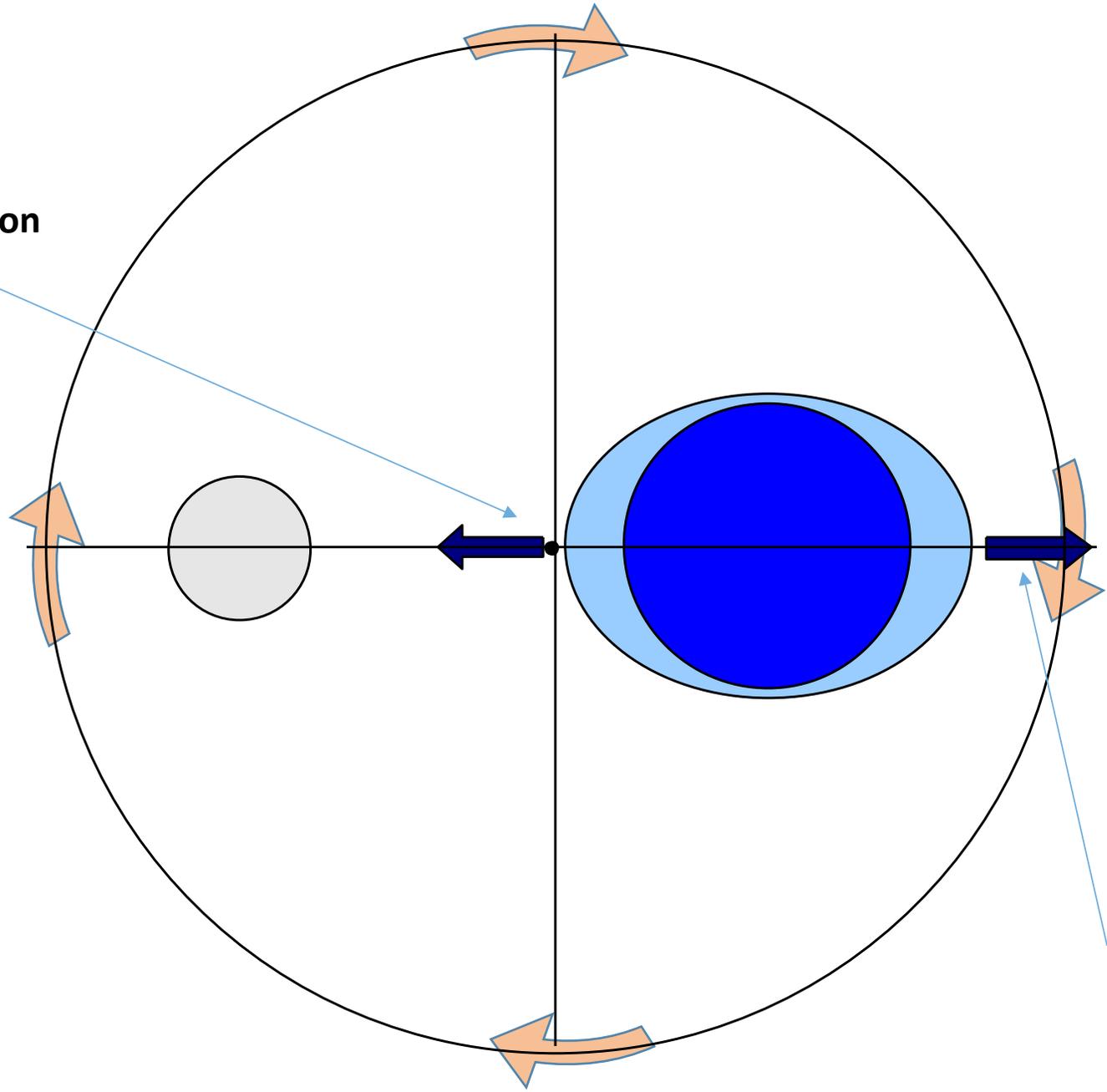


3-Le mécanisme des tsunamis :



Gravitation et inertie

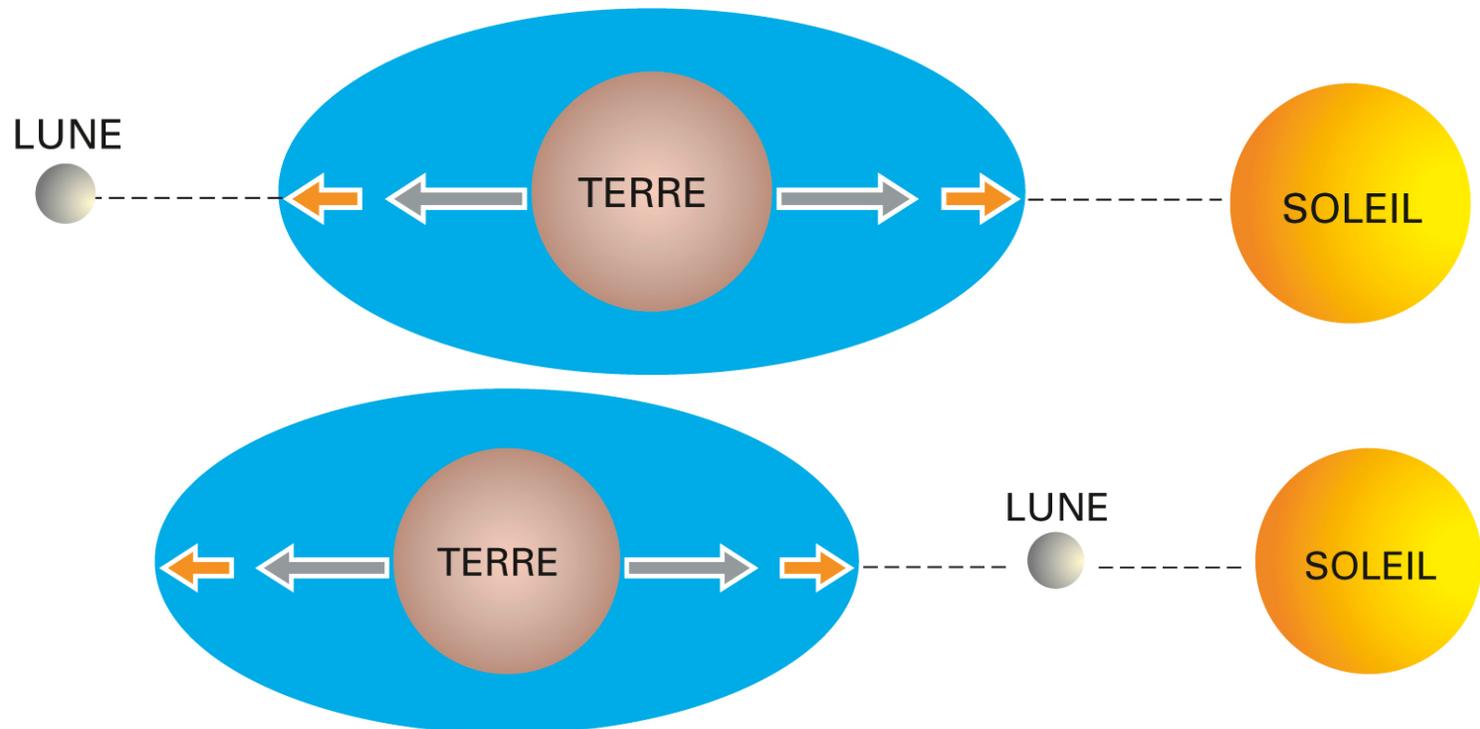
Force d'attraction



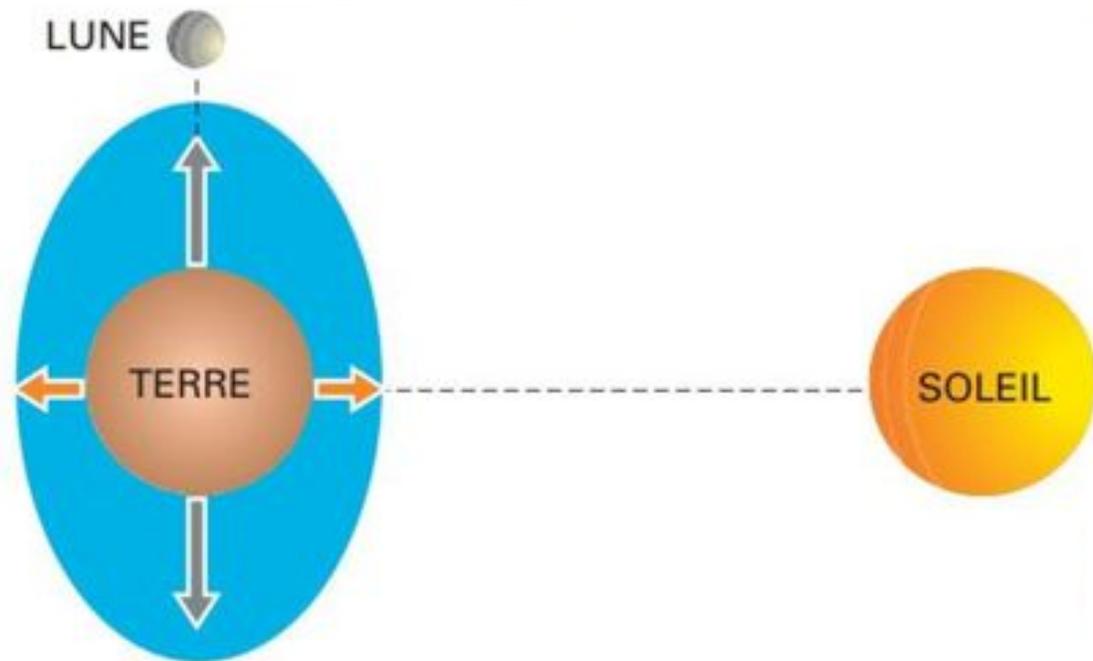
Force d'inertie

Marées de vives eaux et de mortes eaux

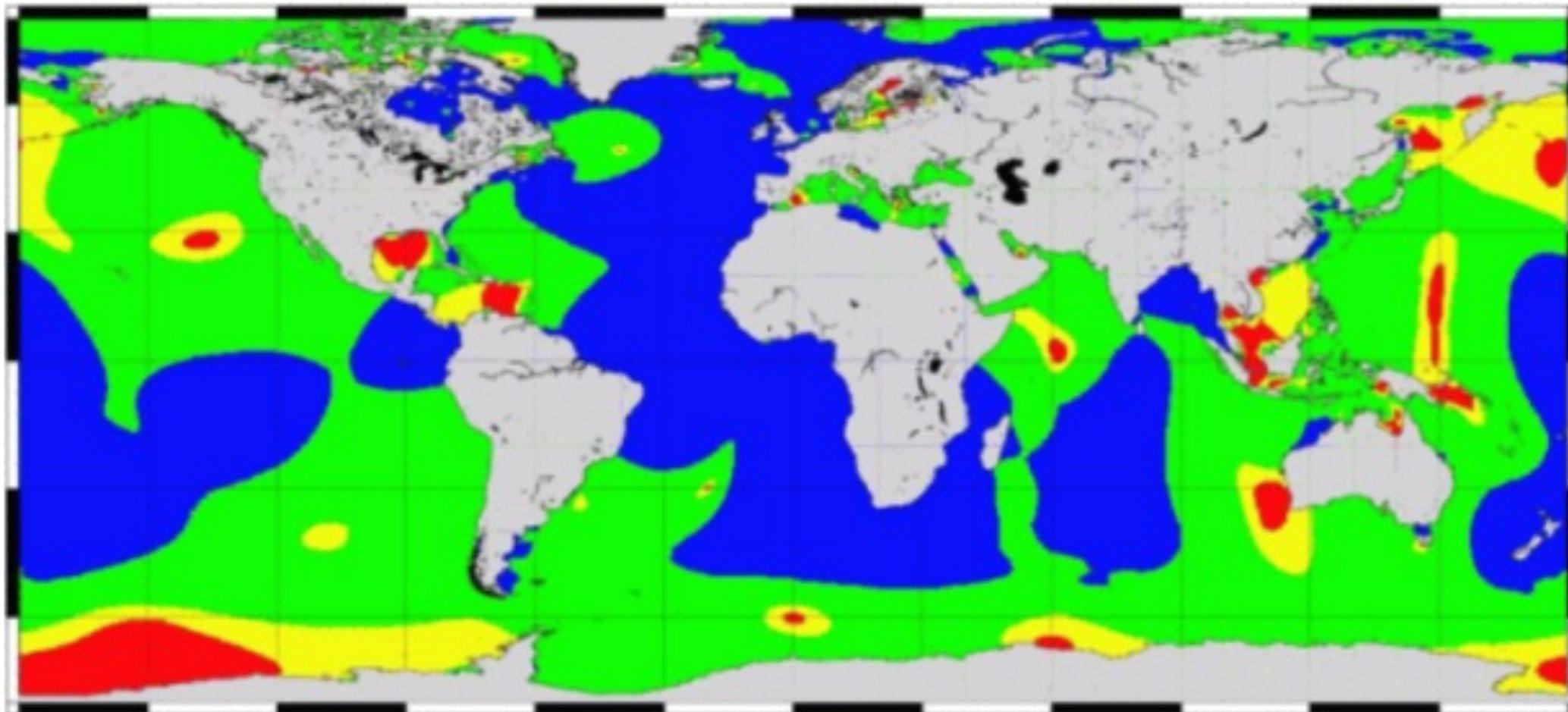
Marées de
vives eaux



Marées de
mortes eaux

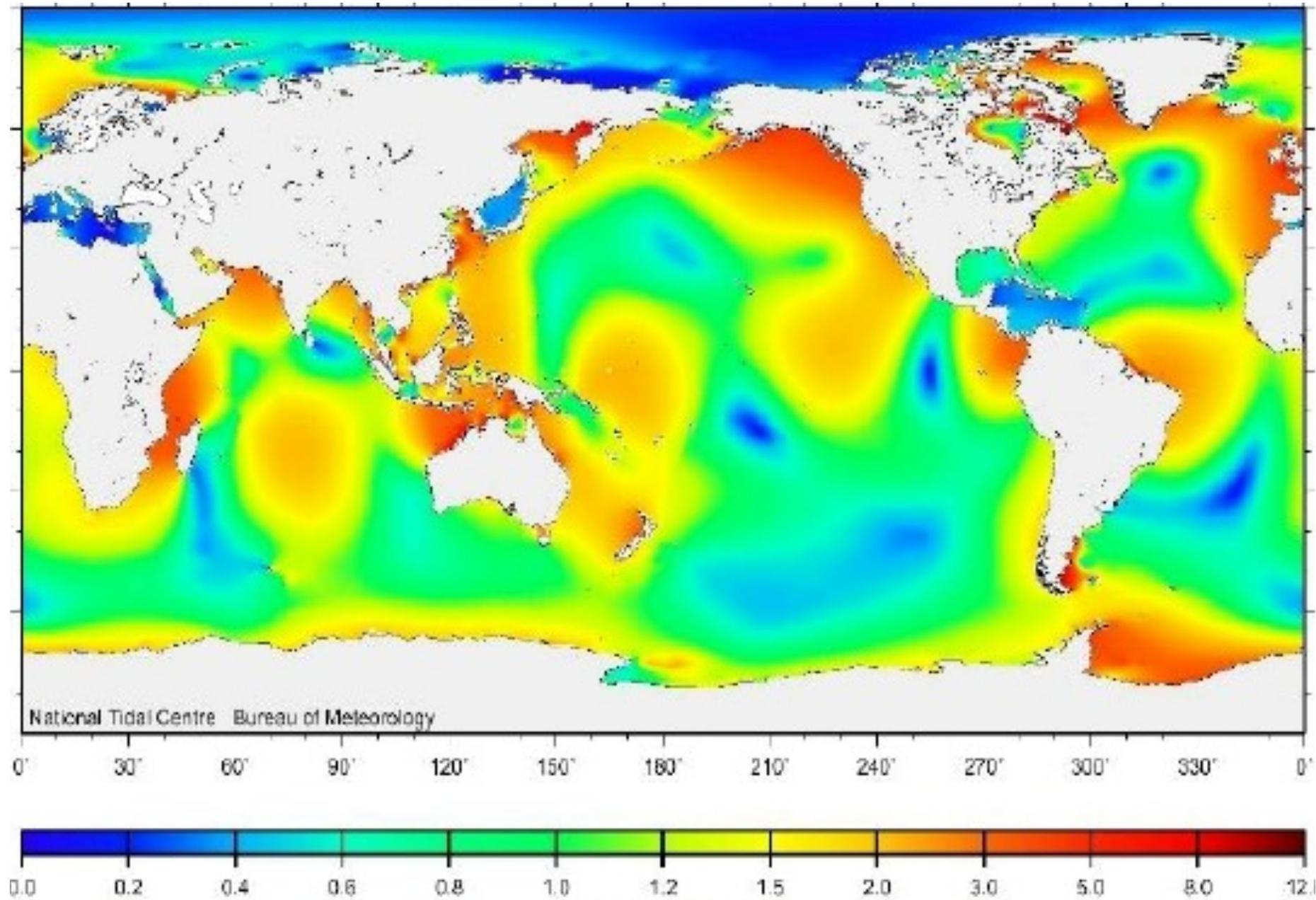


Les types de marées



- 1-Deux marées par jour
- 2-Une marée par jour
- 3-Une petite et une grande marée par jour
- 4- Tantôt 1, tantôt 2

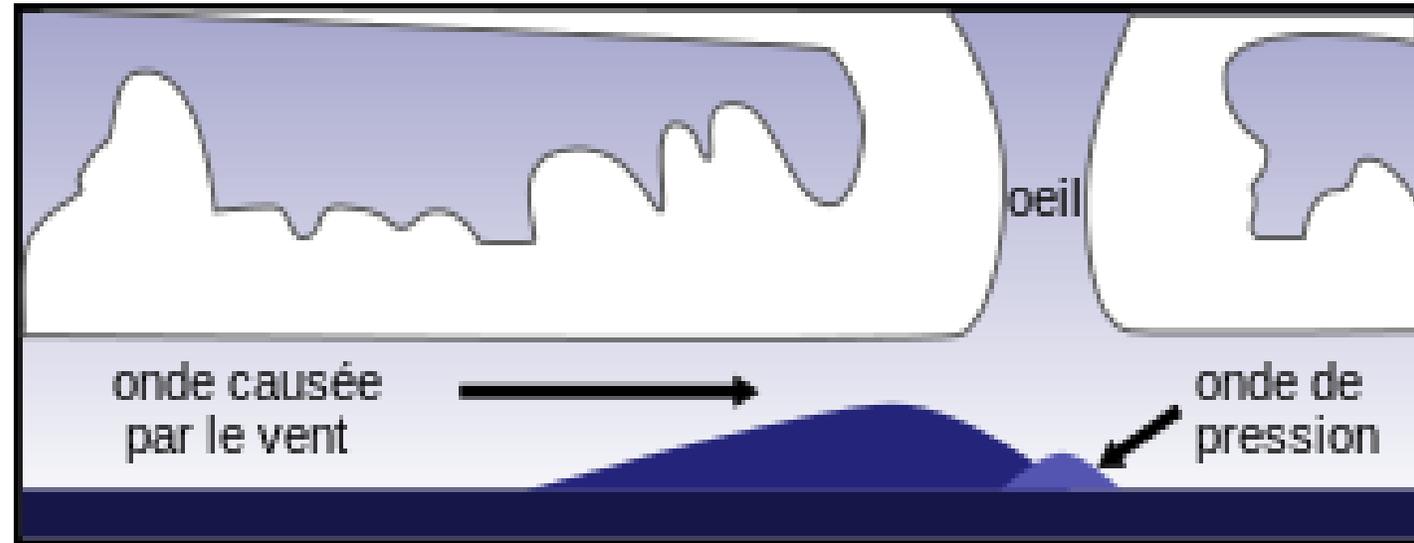
Amplitude moyenne des marées



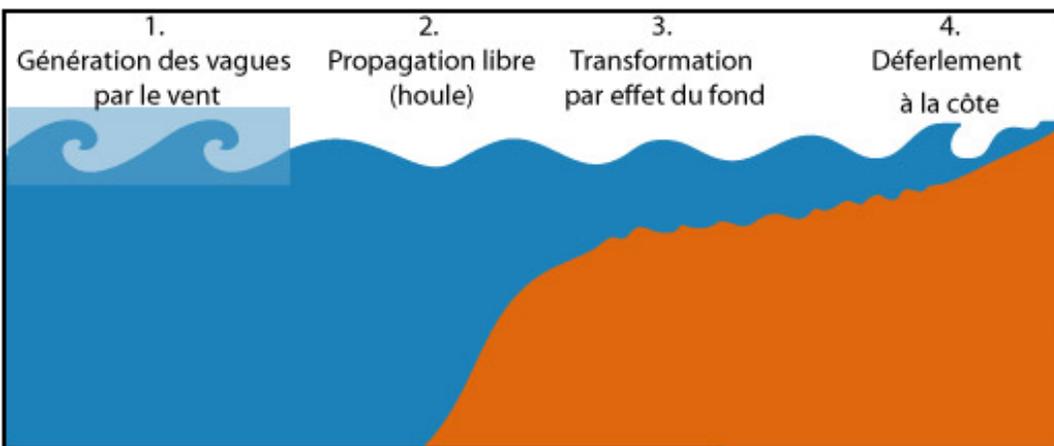
Vagues scélérates



Onde de tempête



Houle



Mascaret

