



Baru Volcano, Chiriqui Province

# Intro to the Geology & Paleontology of Panama



Gaillard Cut, Panama Canal

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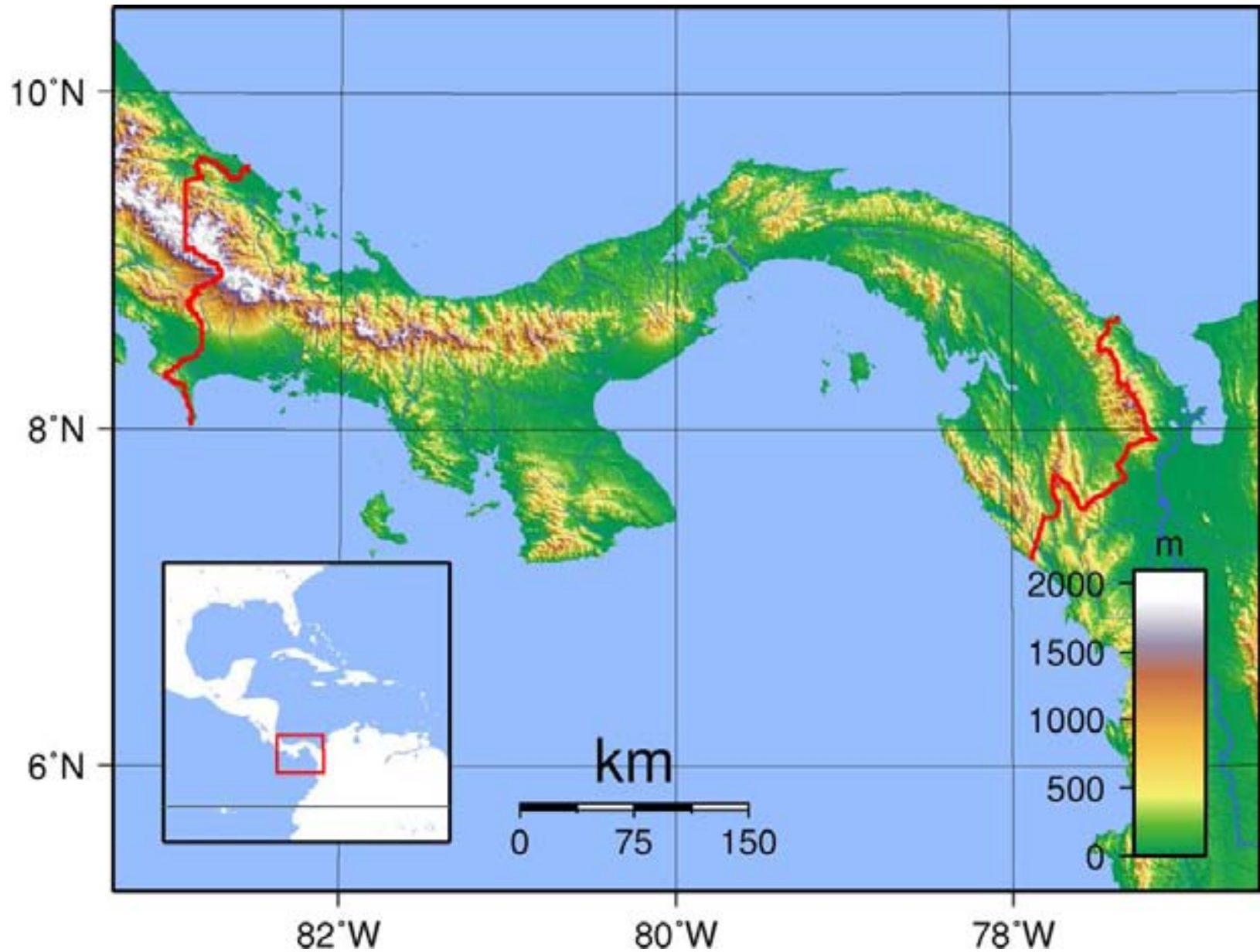


FLORIDA MUSEUM  
OF NATURAL HISTORY

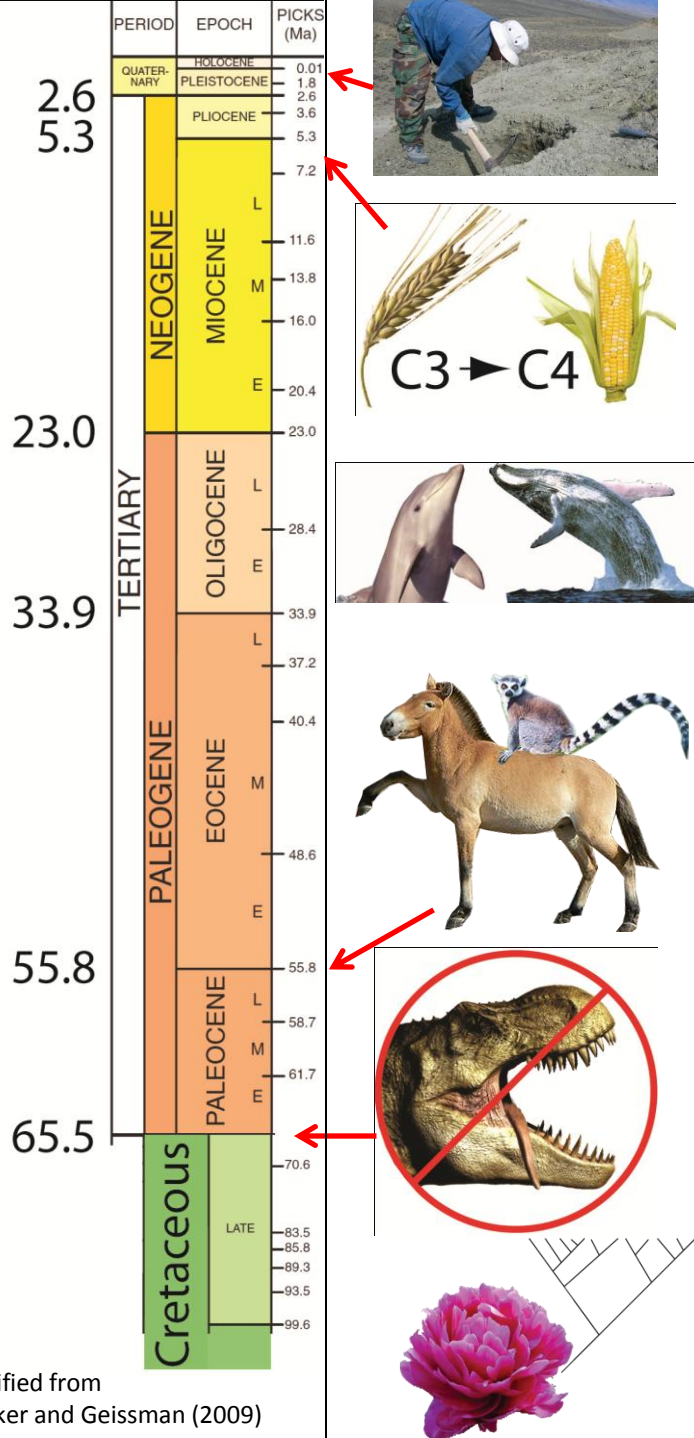


San Blas Mountains, San Blas Province

# Panama Today



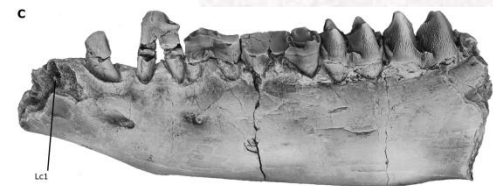
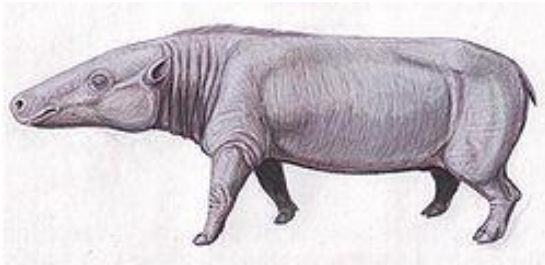
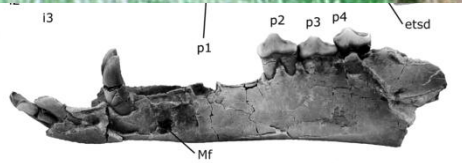
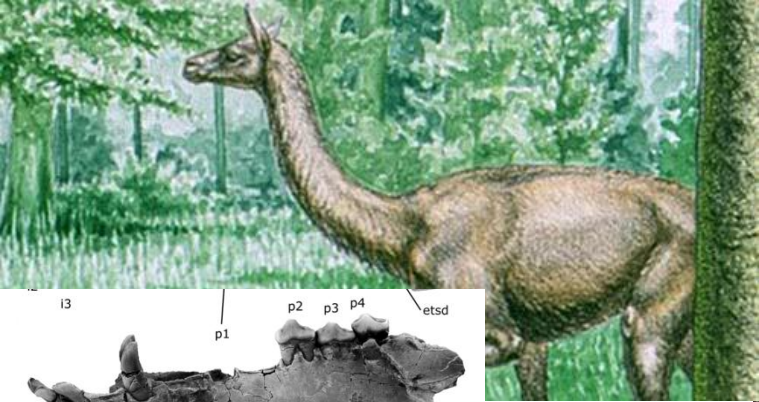
Million years ago



↑  
 Closure of the Central American Seaway?  
 ↓  
 Extension of Panama Canal Basin and deposition of terrestrial record  
 Uplift & exhumation of intrusive igneous bodies due to impact with South America  
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 Volcanic arc development during plate subduction  
 ↓

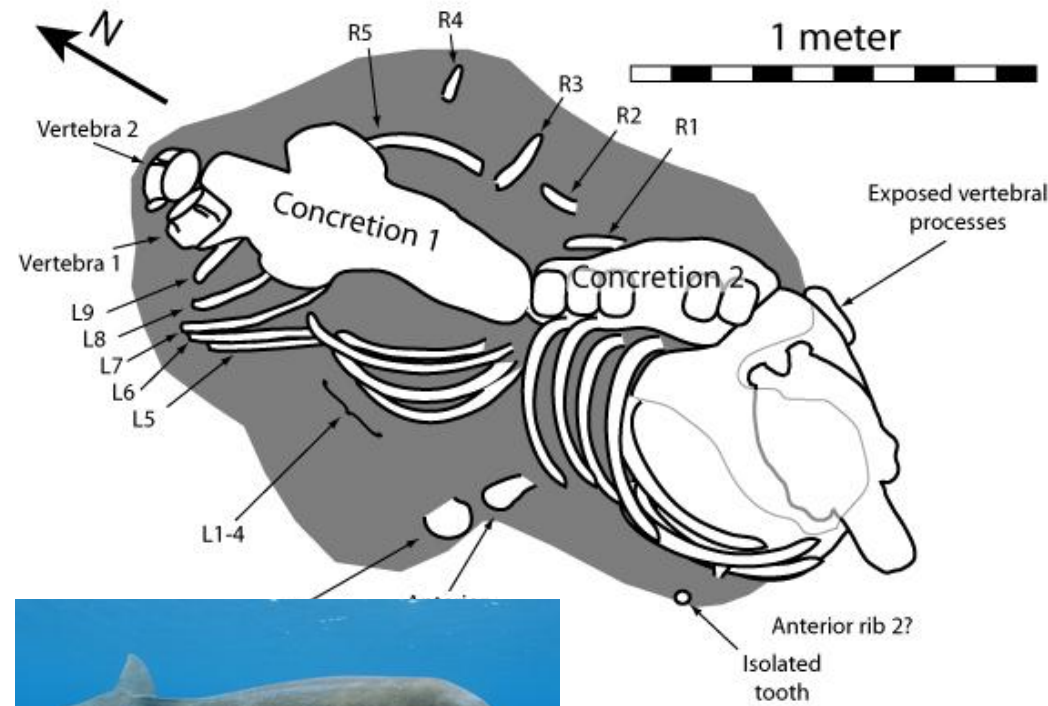
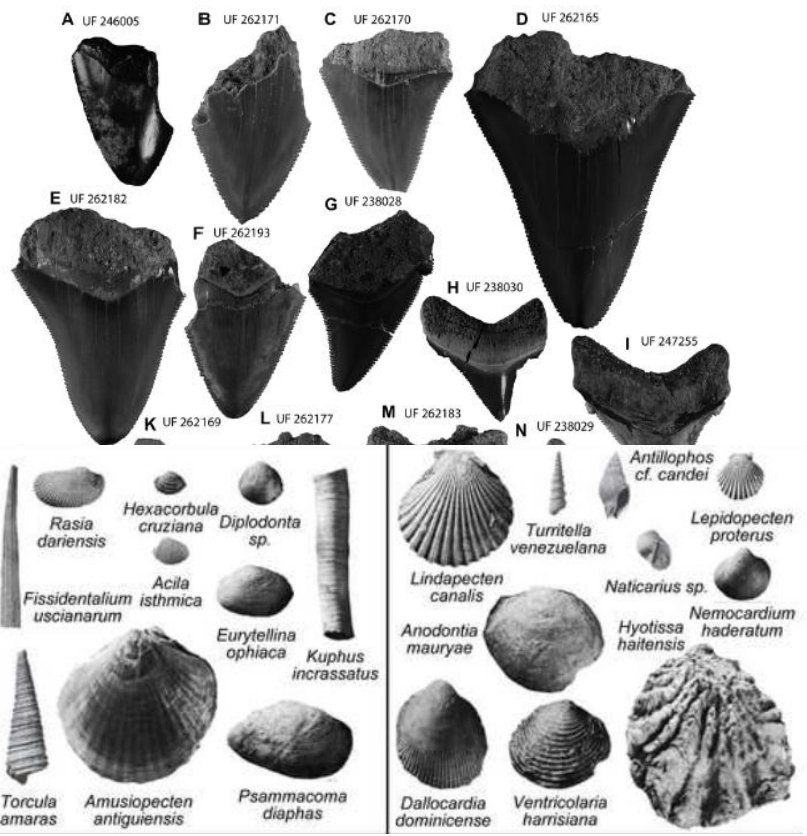


# Las Cascadas Fm.





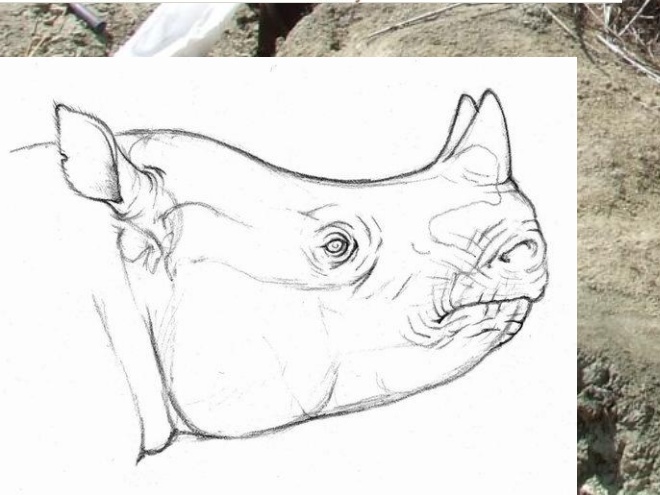
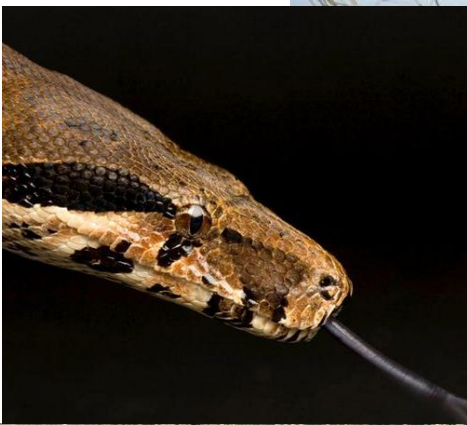
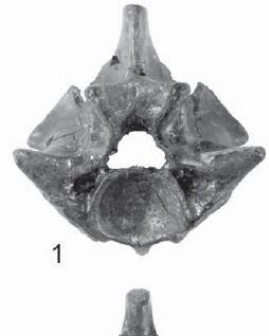
# Culebra Fm.





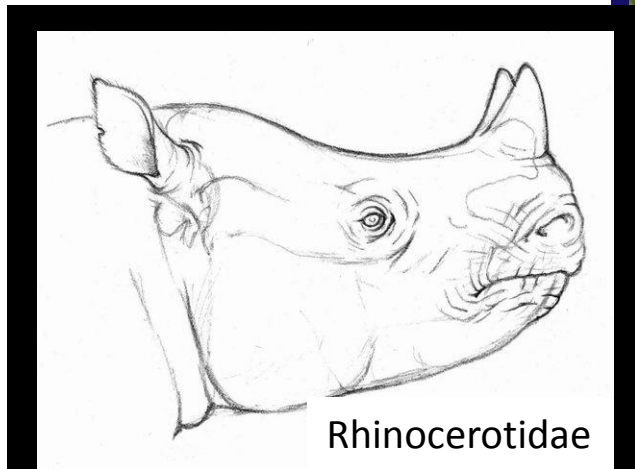
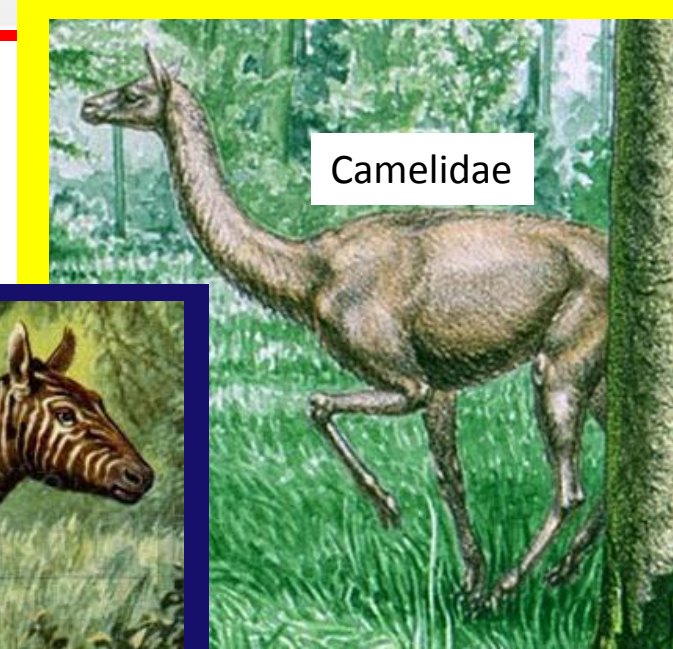
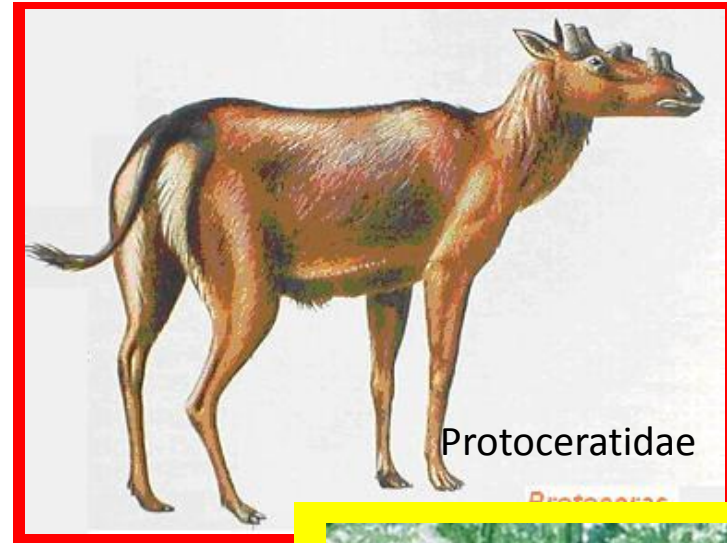
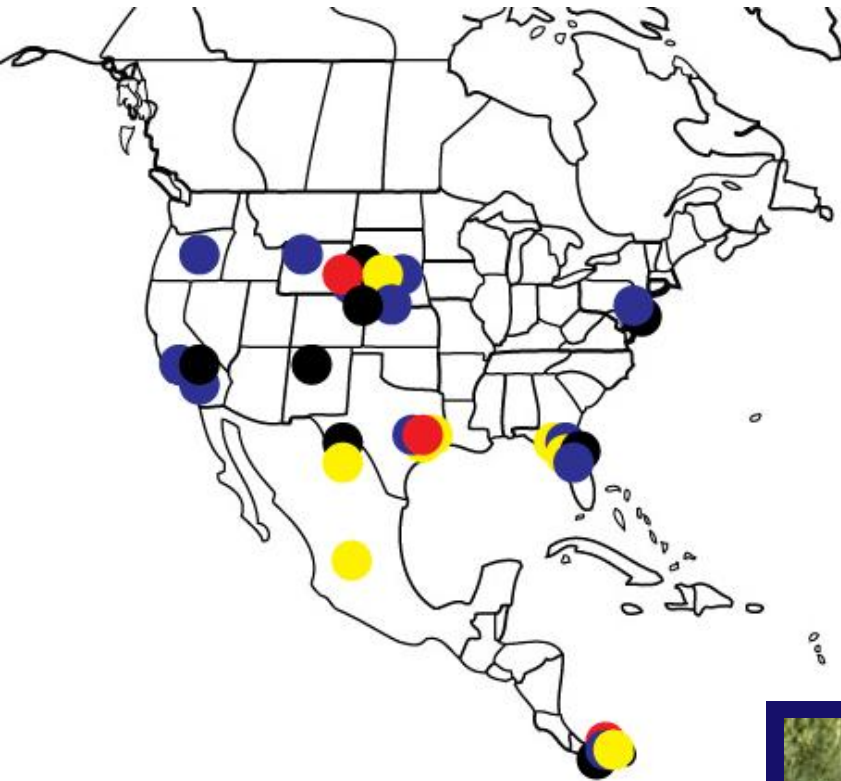
# Cucaracha Fm

B



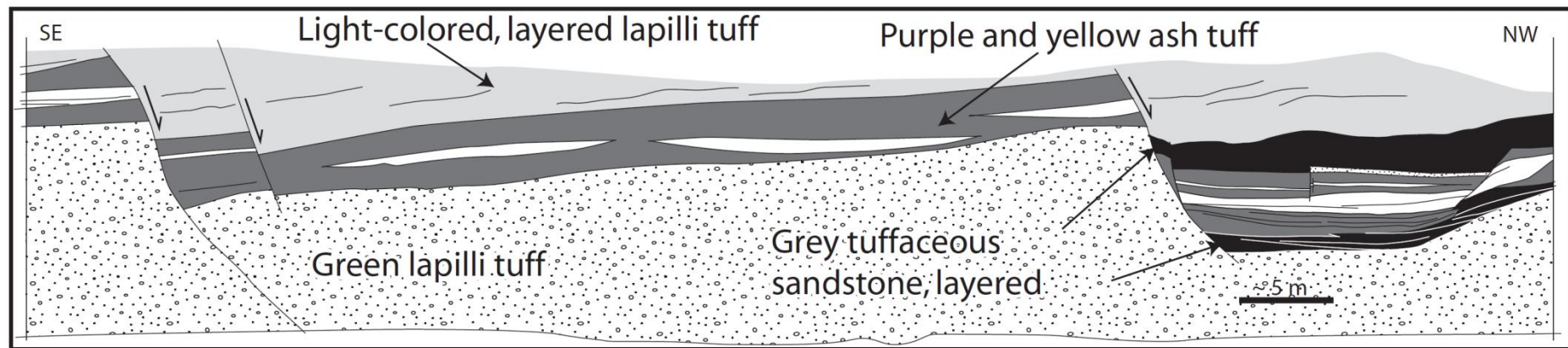


# A Cosmopolitan Fauna





# New exposures along the canal





# Exposures in 10-20 years

?





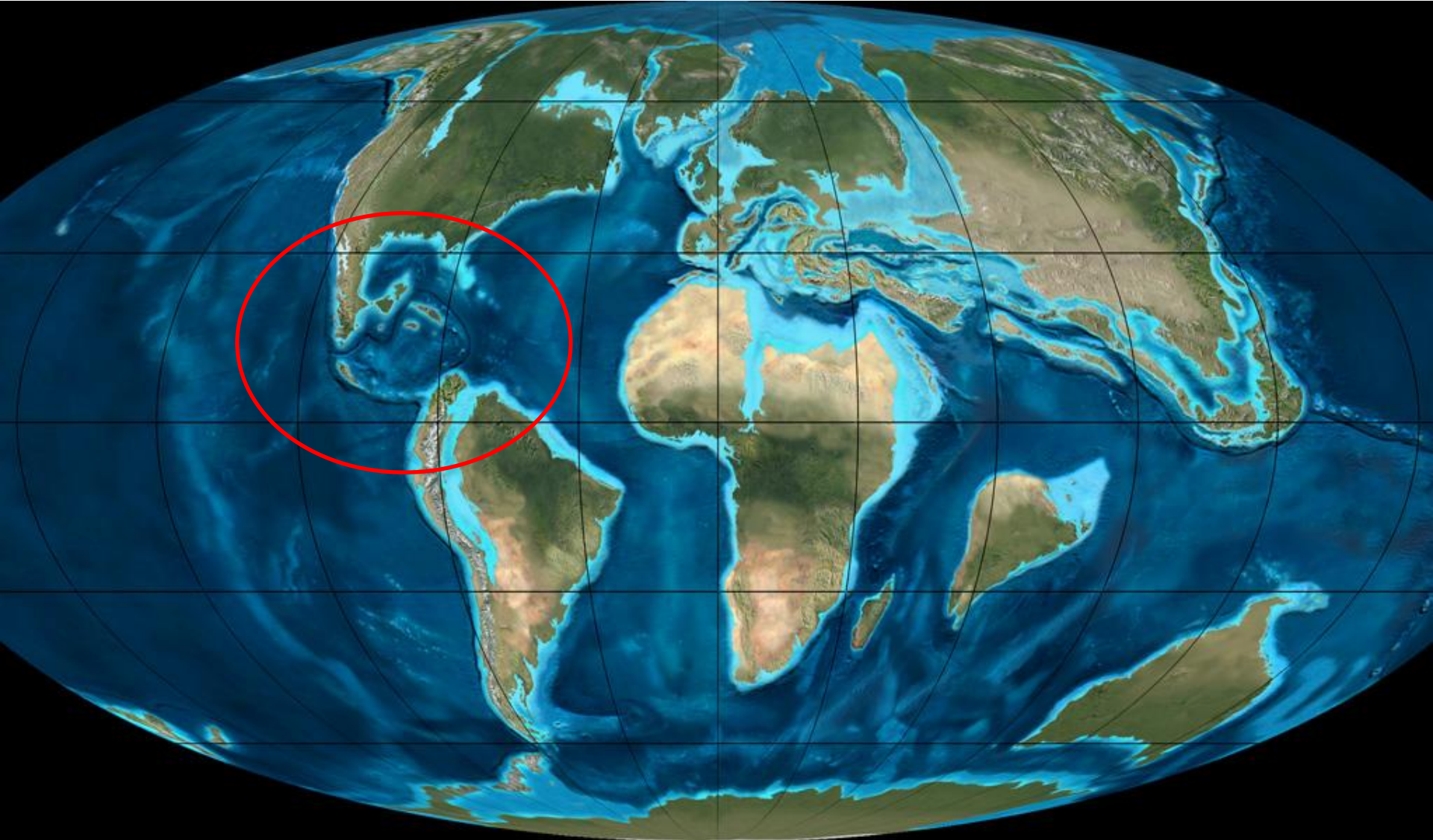
# Prospecting beneath the lava flows



The volcanic rocks above our most productive fossil localities provide clues about how the Panama Canal Basin was formed.

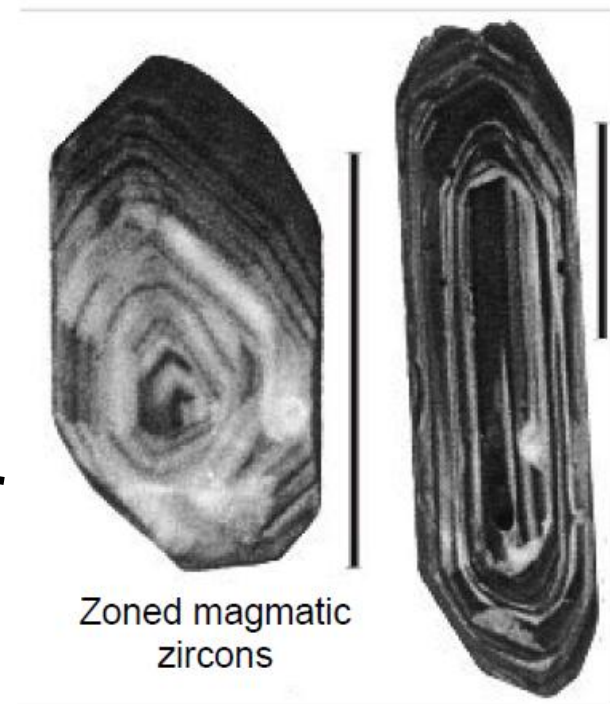
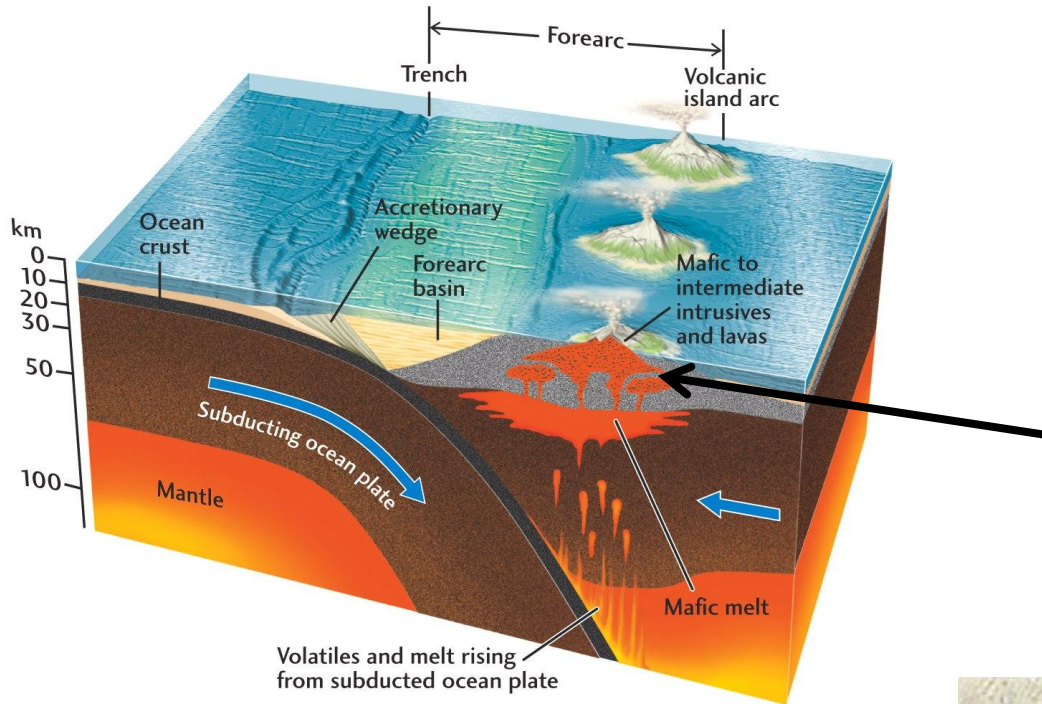


65 million years ago





# Zircons and thermochronology



Zircons form in intrusive magmatic bodies and contain radioactive elements.

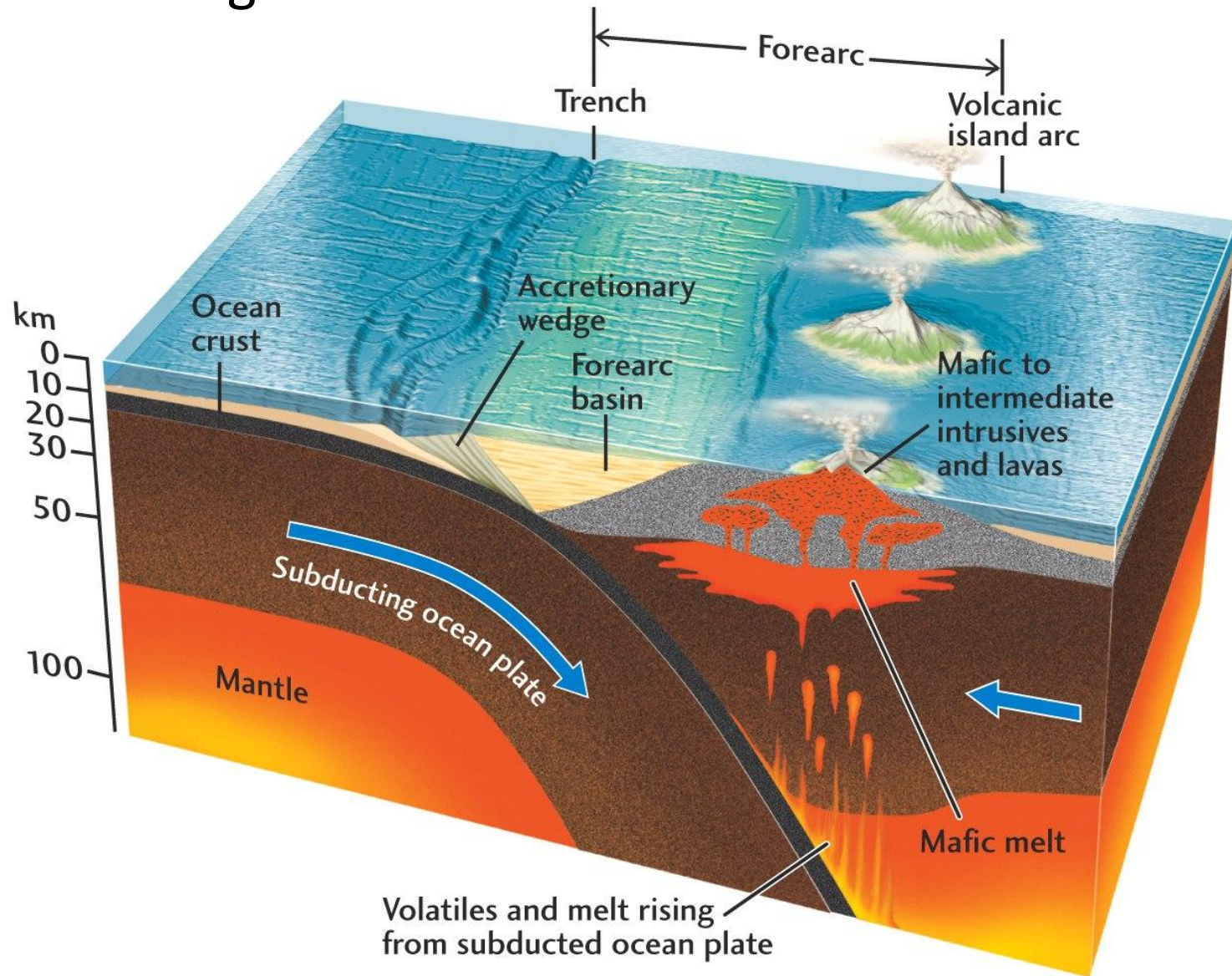
Above a certain temperature, emitted particles leave no tracks.

Below that temp, emitted particles leave distinguishable tracks that can be measured to determine time since cooling.





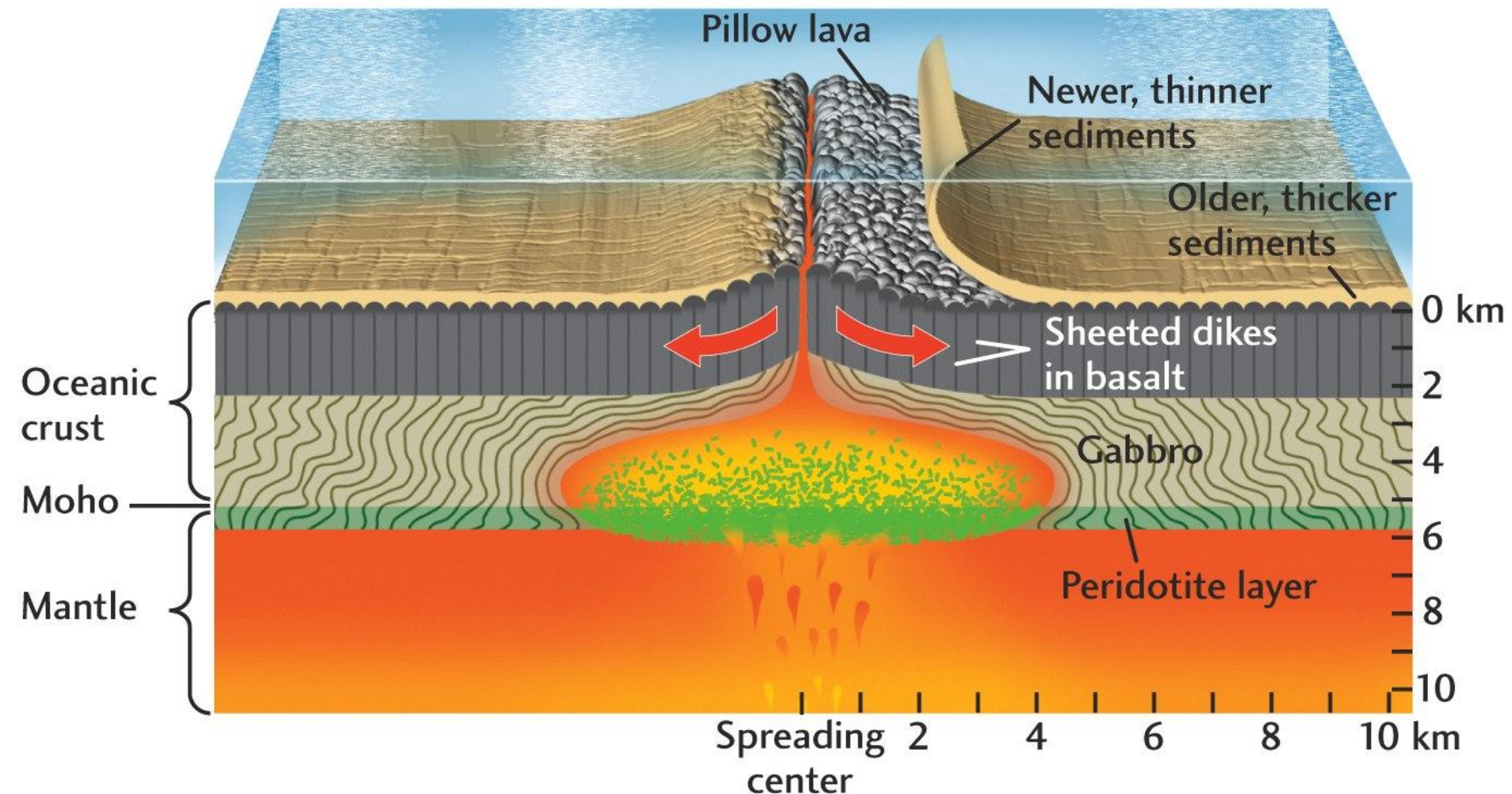
# Hydrous melting at subduction zones



Magma produced in this way have **high** concentrations of fluid mobile elements



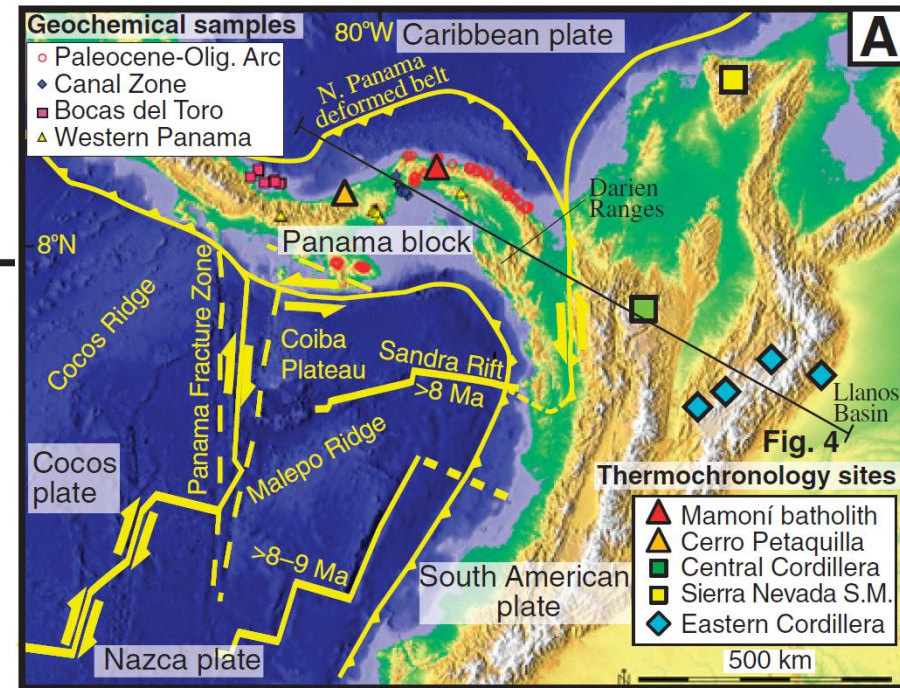
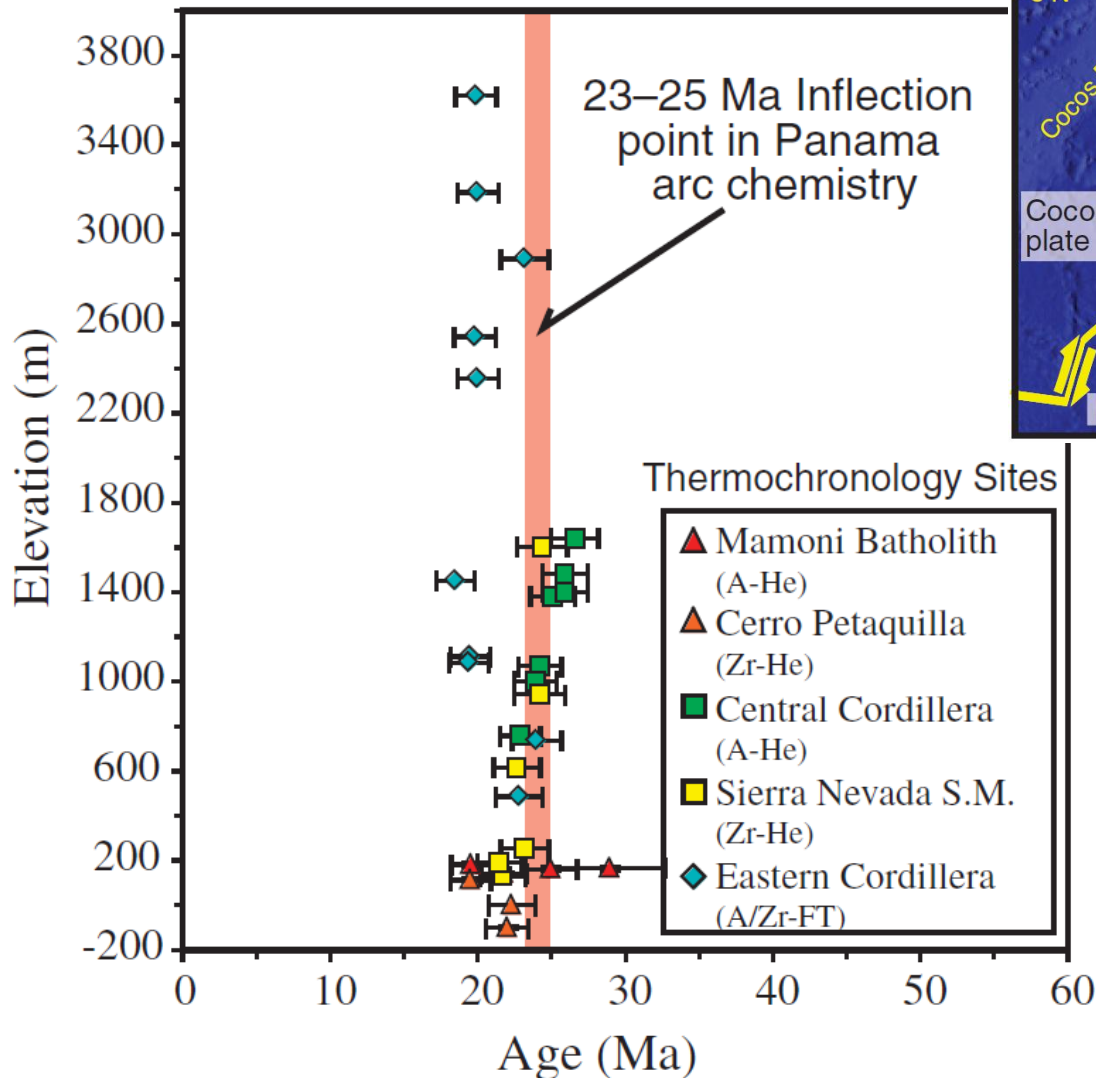
# Decompression melting



Magma produced in this way have **low** concentrations of fluid mobile elements



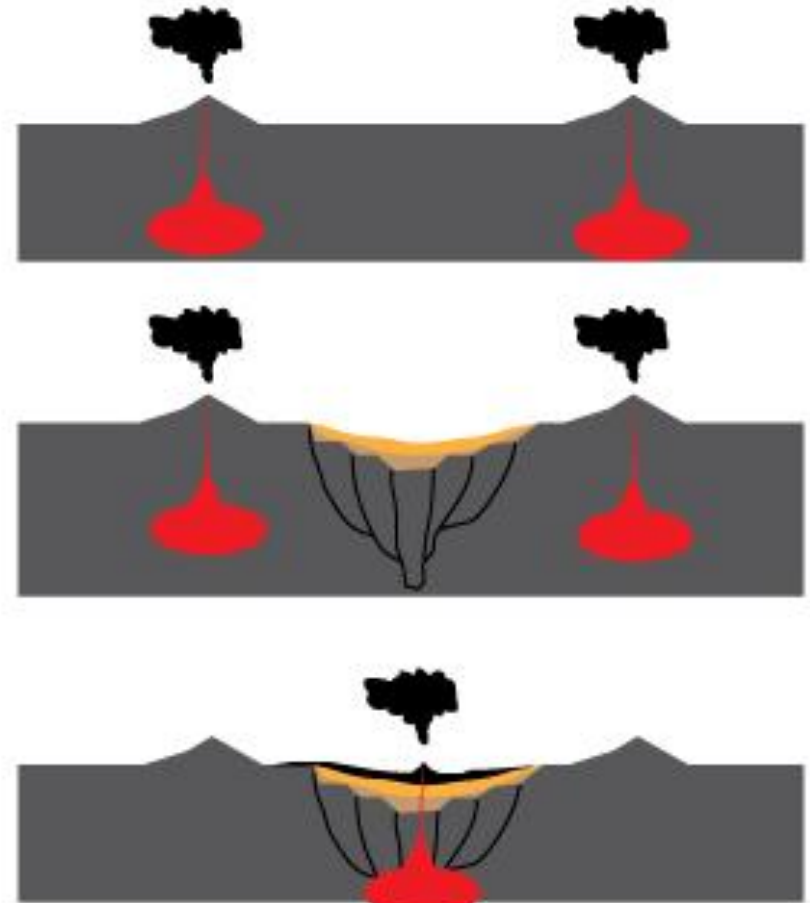
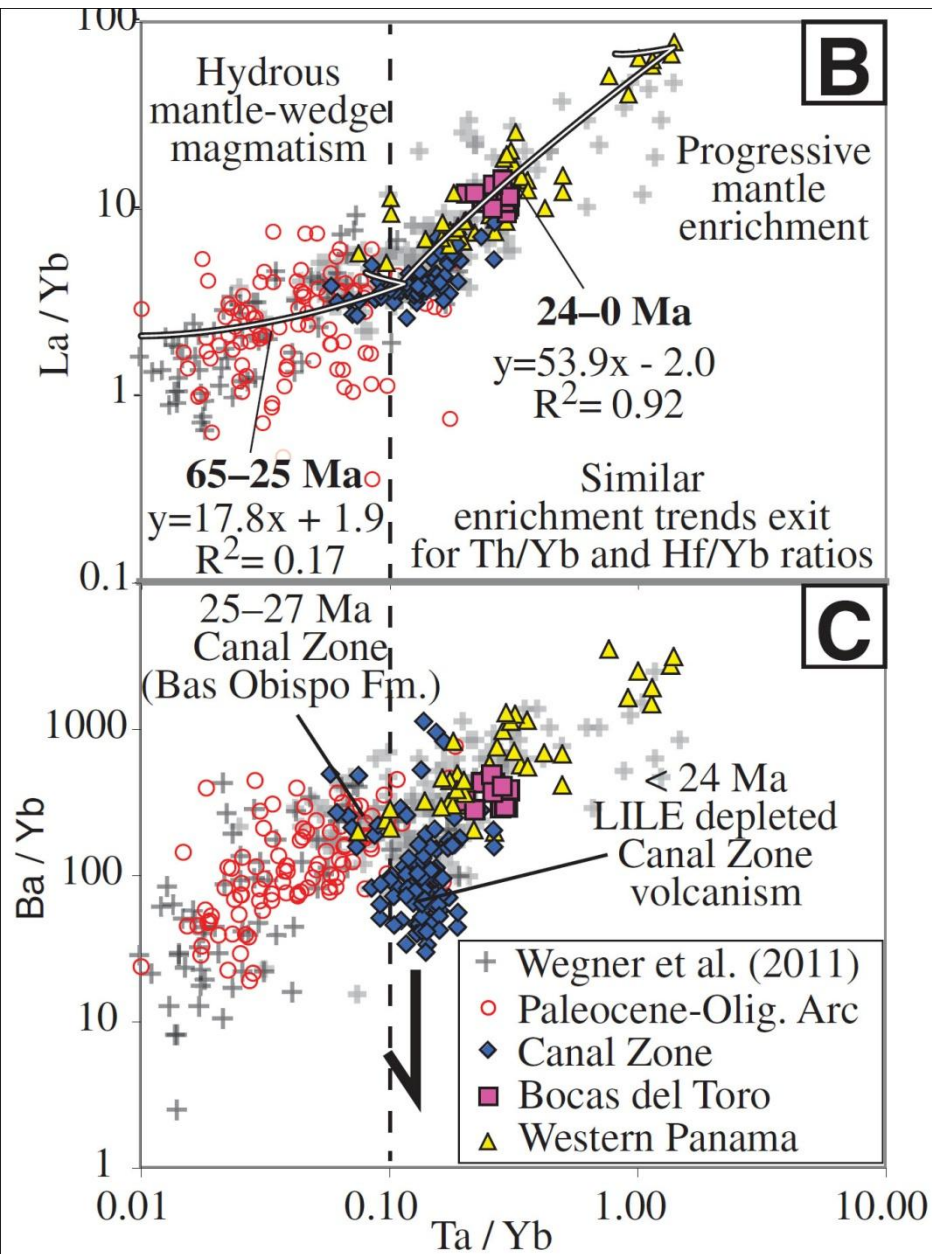
# Fission track thermochronology of Panama-Colombian intrusive rocks



Farris et al (2011)

Fission track results show intrusives were all uplifted and cooled between 20 -30 million years ago





Geochemical evidence for switch  
from hydrous melting to  
decompression melting in Canal Basin



# Reconstructed tectonic plate movements

