



answers to

insight@geoazur.unice.fr

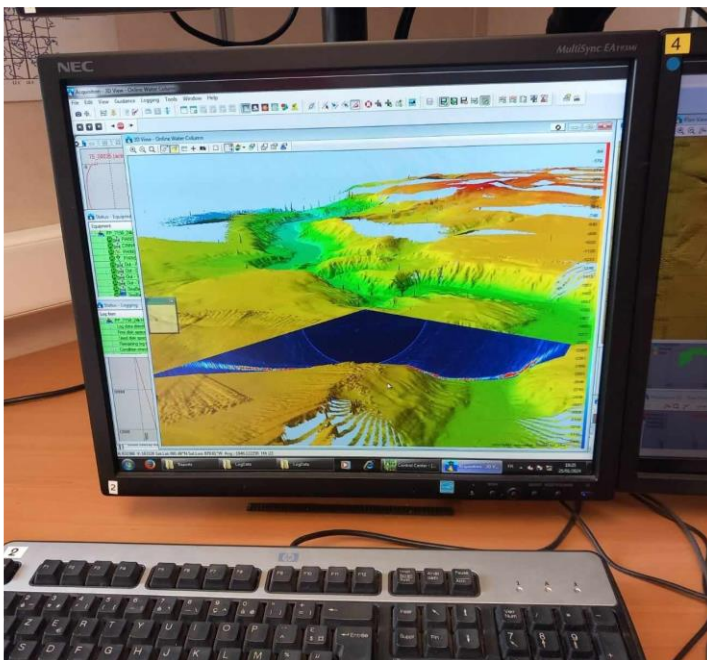
Level of
difficulty



Submarine erosion at the Ecuadorian continental margin

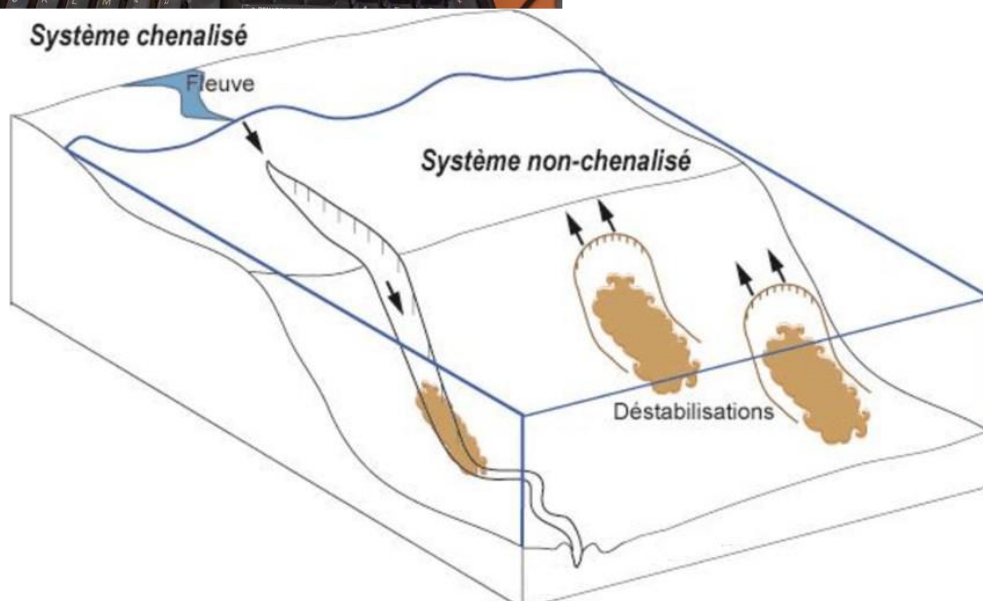
The deep-sea ship Why not? has on-board devices allowing it to carry out bathymetric surveys, that is to say topographic surveys of the underwater relief.

These tools notably enabled the scientists on board to map the underwater canyon of Esmeraldas.



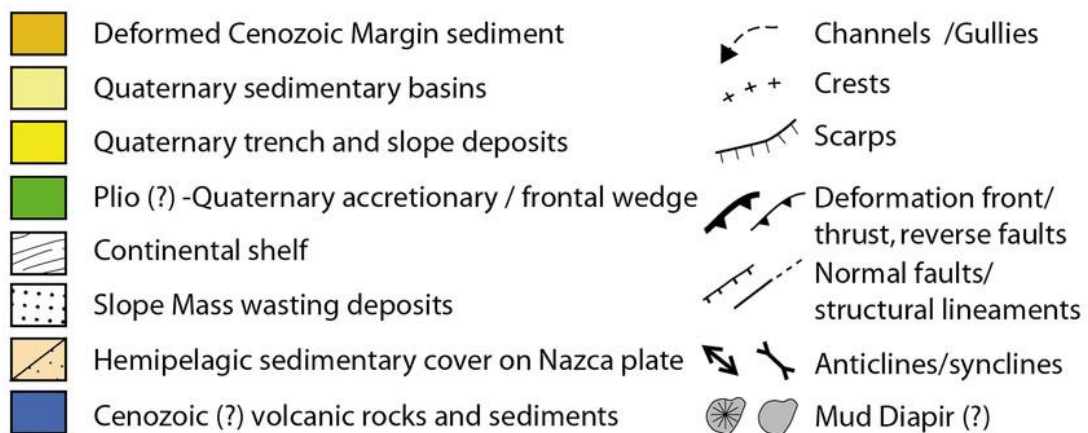
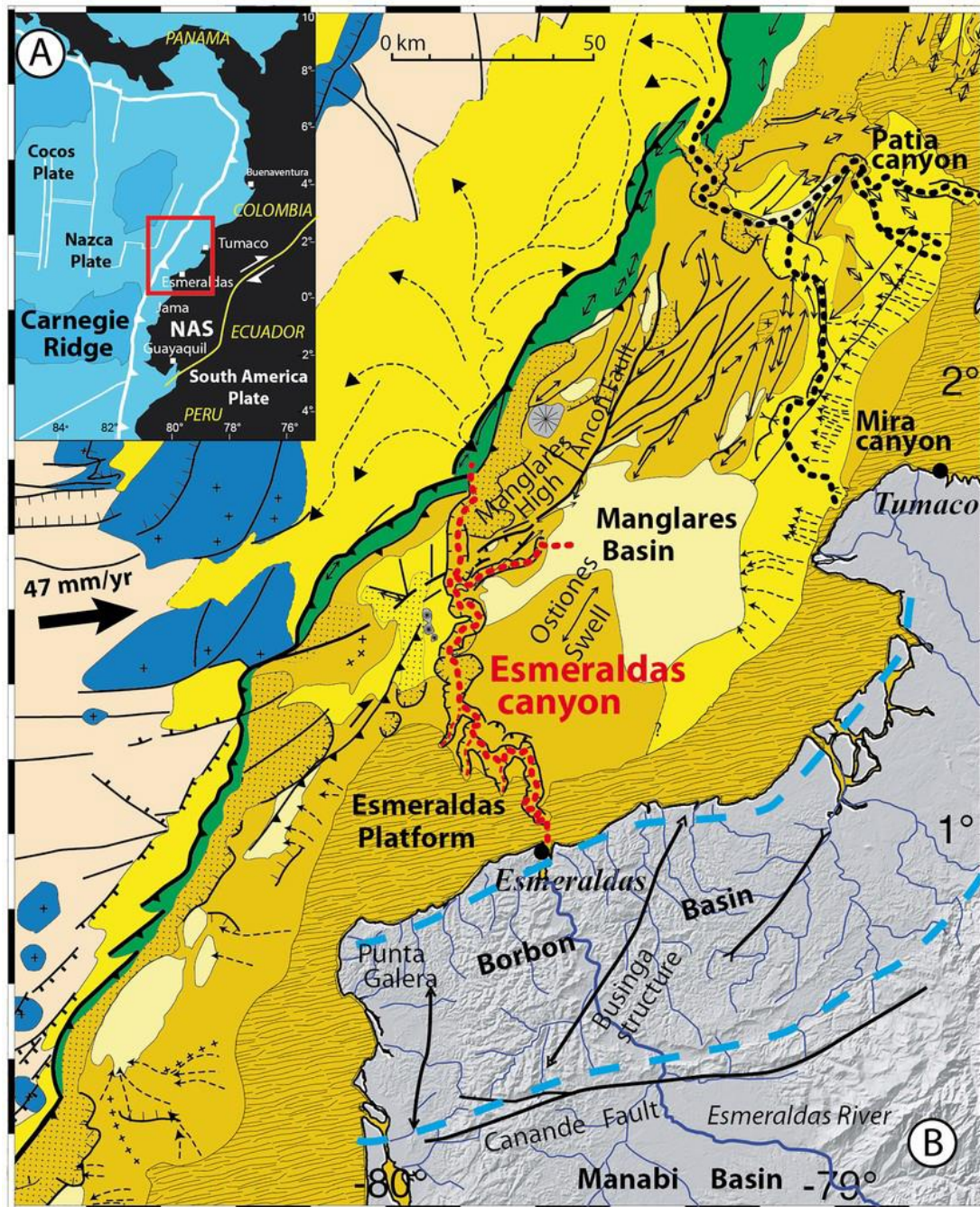
Screenshot of bathymetric surveys in the Esmeraldas submarine canyon sent by François Michaud, head of the SUPER-MOUV mission.

This underwater canyon, located near the epicenter of the 2016 Pedernales mega-earthquake, had already been mapped before the earthquake. The scientists wanted to check if, following this earthquake, the topography of the Esmeraldas canyon was modified.



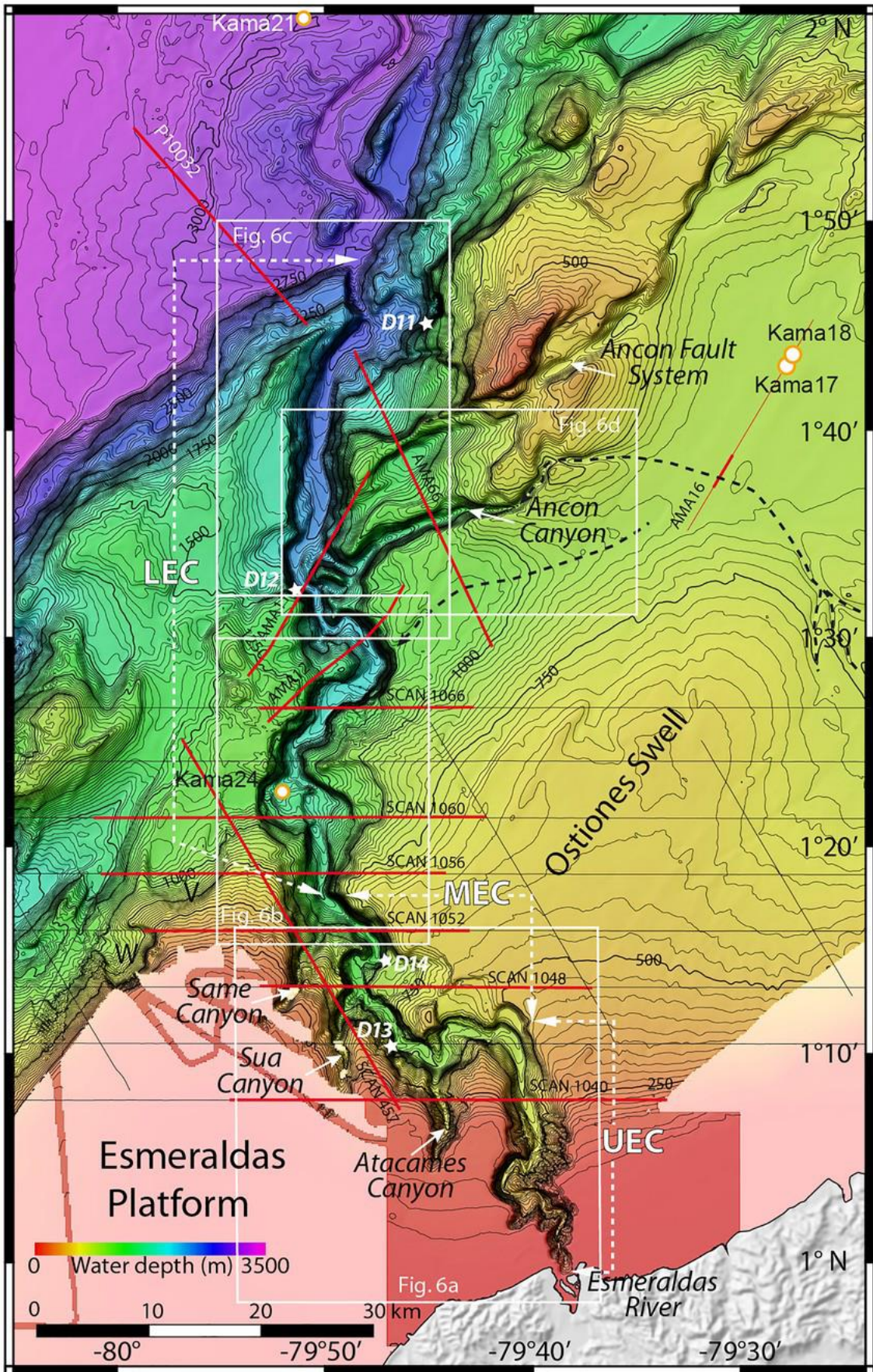
Document 2: Diagram of two models of underwater canyon formation

https://www.researchgate.net/figure/2-Deux-types-de-processus-impliqués-dans-la-formation-des-canyons-dans-un-système_fig2_337103180



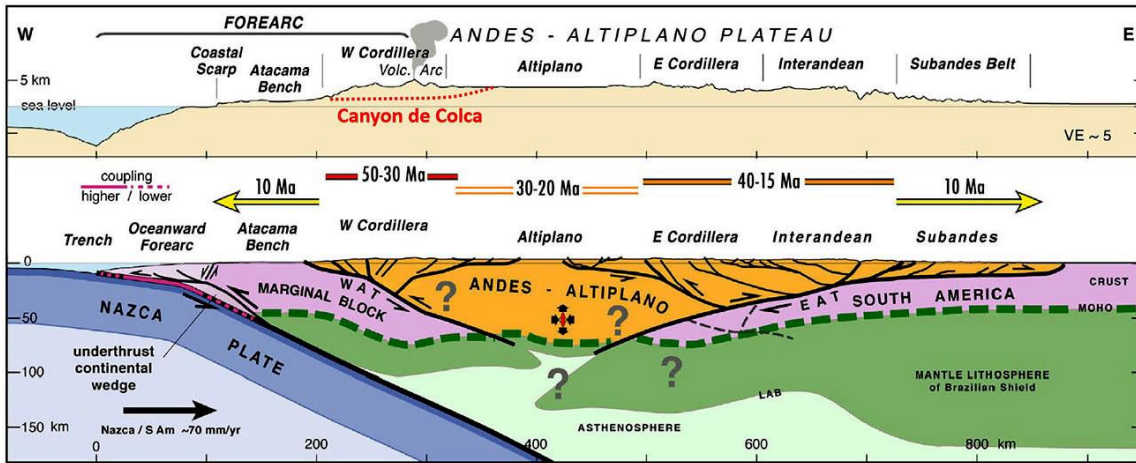
Document 3: Geological context of the Esmeraldas canyon

[https://www.researchgate.net/figure/Geological-context-of-the-Esmeraldas-Canyon-a-
Inset-the-red-frame-is-the-location-of_fig1_334834528](https://www.researchgate.net/figure/Geological-context-of-the-Esmeraldas-Canyon-a-Inset-the-red-frame-is-the-location-of_fig1_334834528)



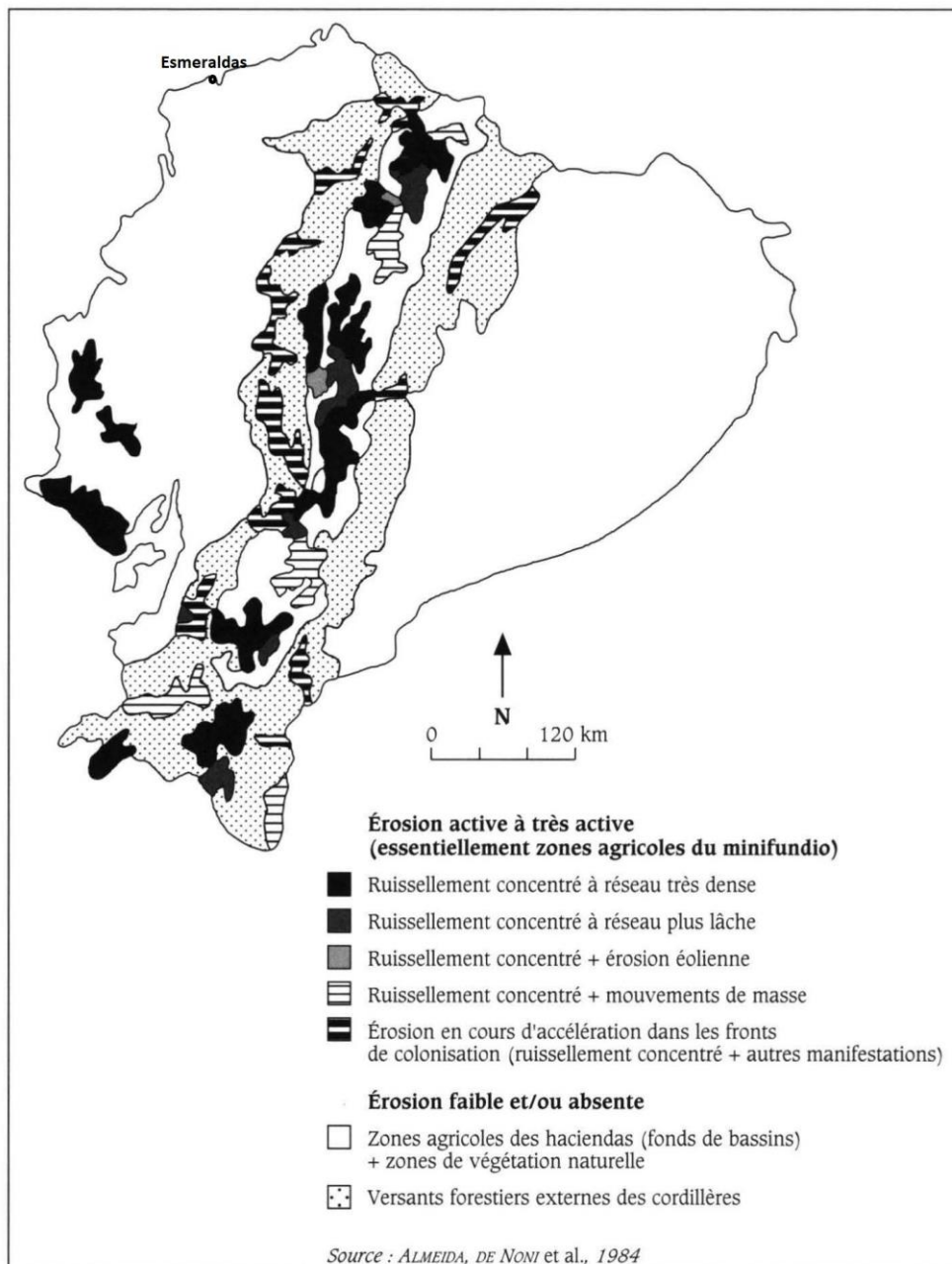
Document 4: Bathymetric map of the Esmeraldas underwater canyon

https://www.researchgate.net/figure/Multibeam-bathymetric-map-of-the-Esmeraldas-Canyon-and-its-tributary-canyons-contour_fig3_334834528



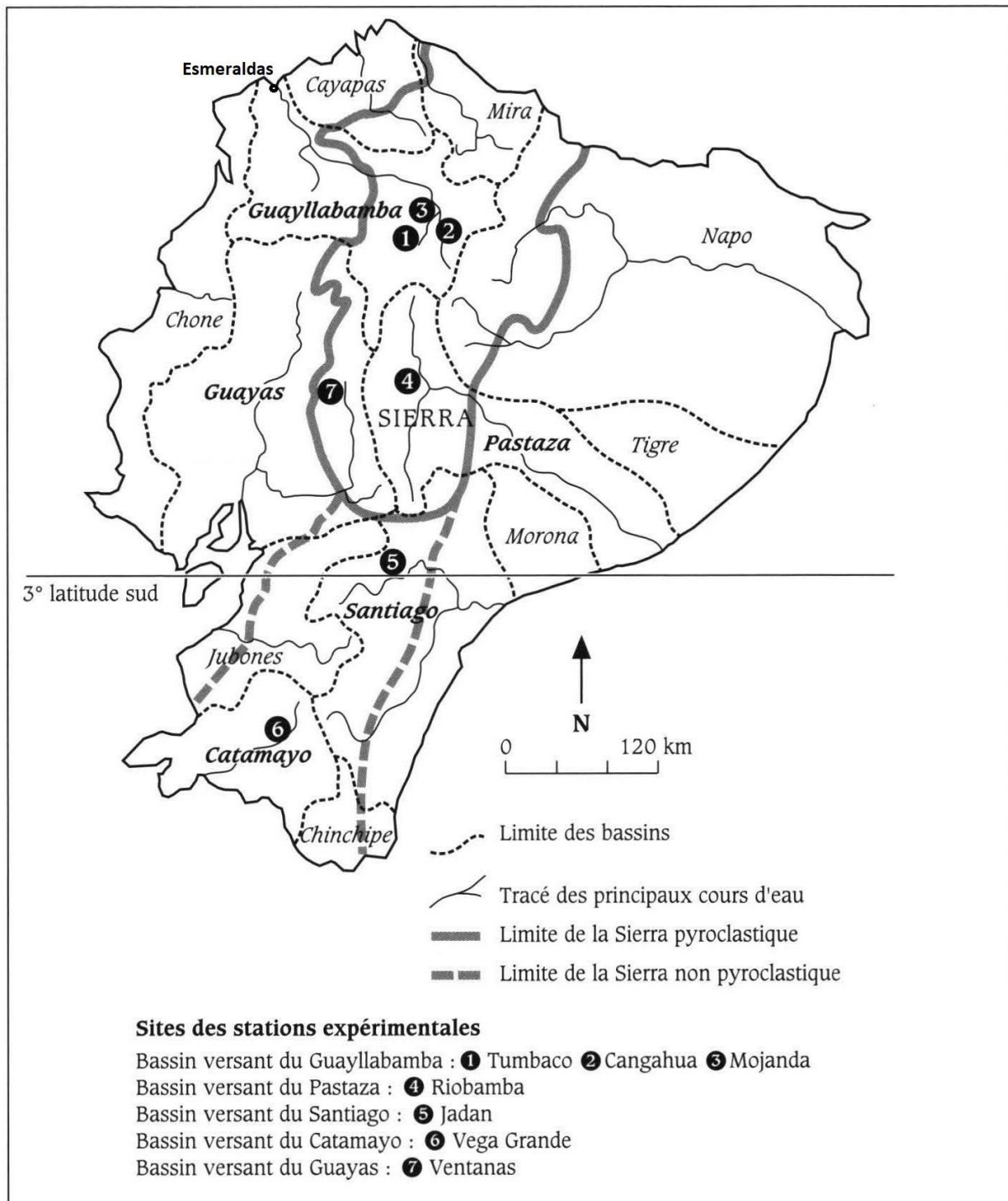
Document 5: Topographic section of the Andes Cordillera (at Peru)

<https://planet-terre.ens-lyon.fr/>



Document 6: Map of erosion in Ecuador

<https://books.openedition.org/irdeditions/8384>



Document 7: Map of watersheds in Ecuador

<https://books.openedition.org/irdeditions/8387>



Junior level:

Determine, using arguments found in the proposed resources (documents 1 to 4), to which canyon model corresponds the submarine canyon of Esmeraldas located near the coast of Ecuador.

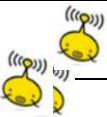
You can also rely on:

<https://earth.google.com/>



Intermédiaire level:

Using your knowledge and the resources provided (documents 1 to 7), explain the formation of the Esmeraldas underwater canyon.



Expert level:

Using a diagram(s), present the principle of bathymetry measurements carried out on board the Pourquoi pas?:

You can rely on:

<https://data.ifremer.fr/Tout-savoir-sur-les-donnees/Disciplines/Geophysique/Bathymetrie>
and

<https://www.flotteoceanographique.fr/Nos-moyens/Outils-des-navires/Equipements-des-navires/Equipements-acoustiques/Sondeurs-multifaisceaux-pour-les-fonds-marins>

We await for your results and discoveries on:

insight@geoazur.unice.fr

Enjoy the discoveries and until next time for the continuation of the adventure !