

# DEFINING THE NORTH AMERICAN - SOUTH AMERICAN PLATE BOUNDARY AT THE ANTILLES SUBDUCTION ZONE

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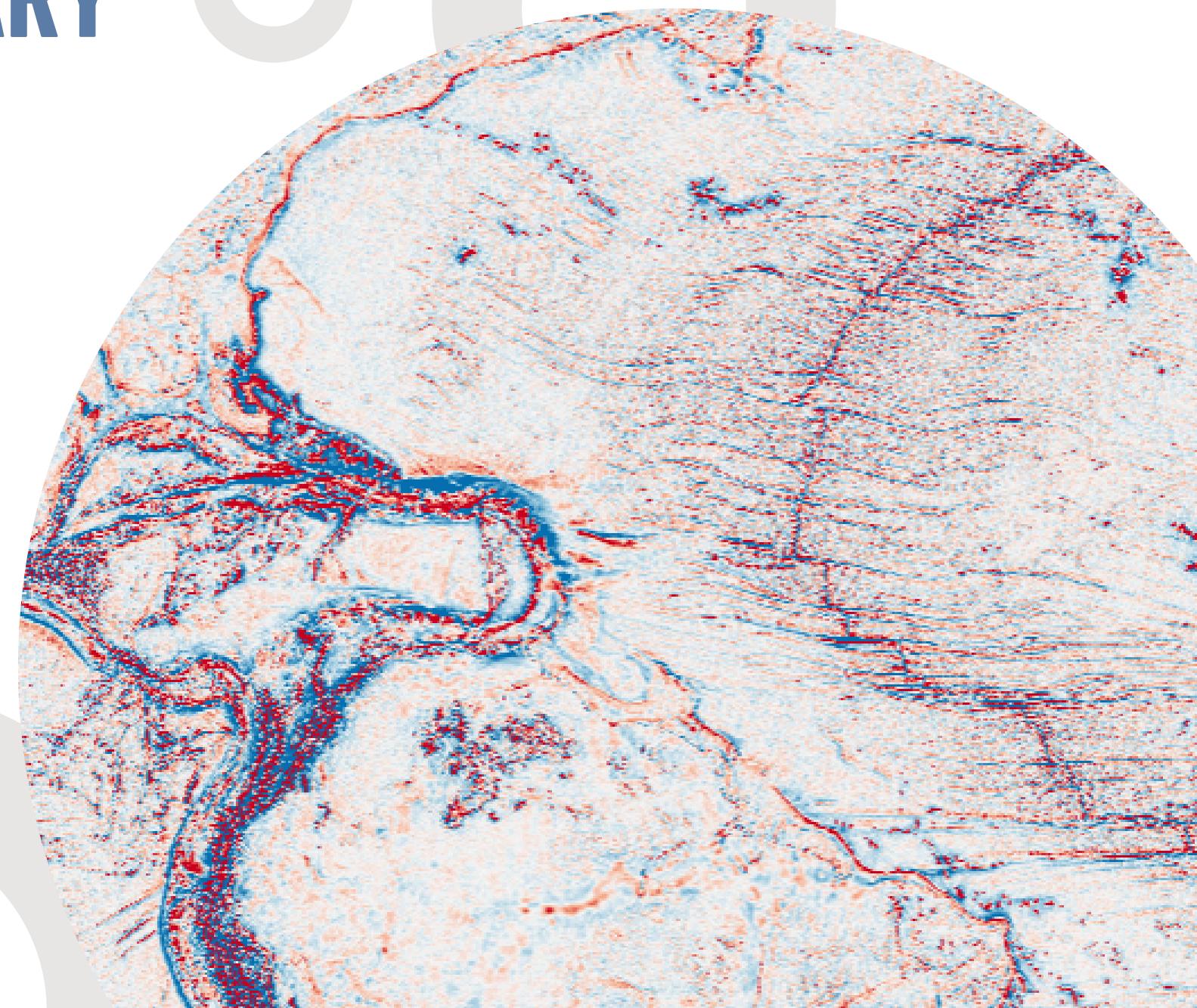
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**M2 Internship**



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# Plan for Today

No solid results to show... yet! But science takes time, therefore:



**Historical Views on the Plate Boundary Location**



**Revisiting the Boundary: Insights from the Demerara Plateau**



**Internship Goals and Current Work**

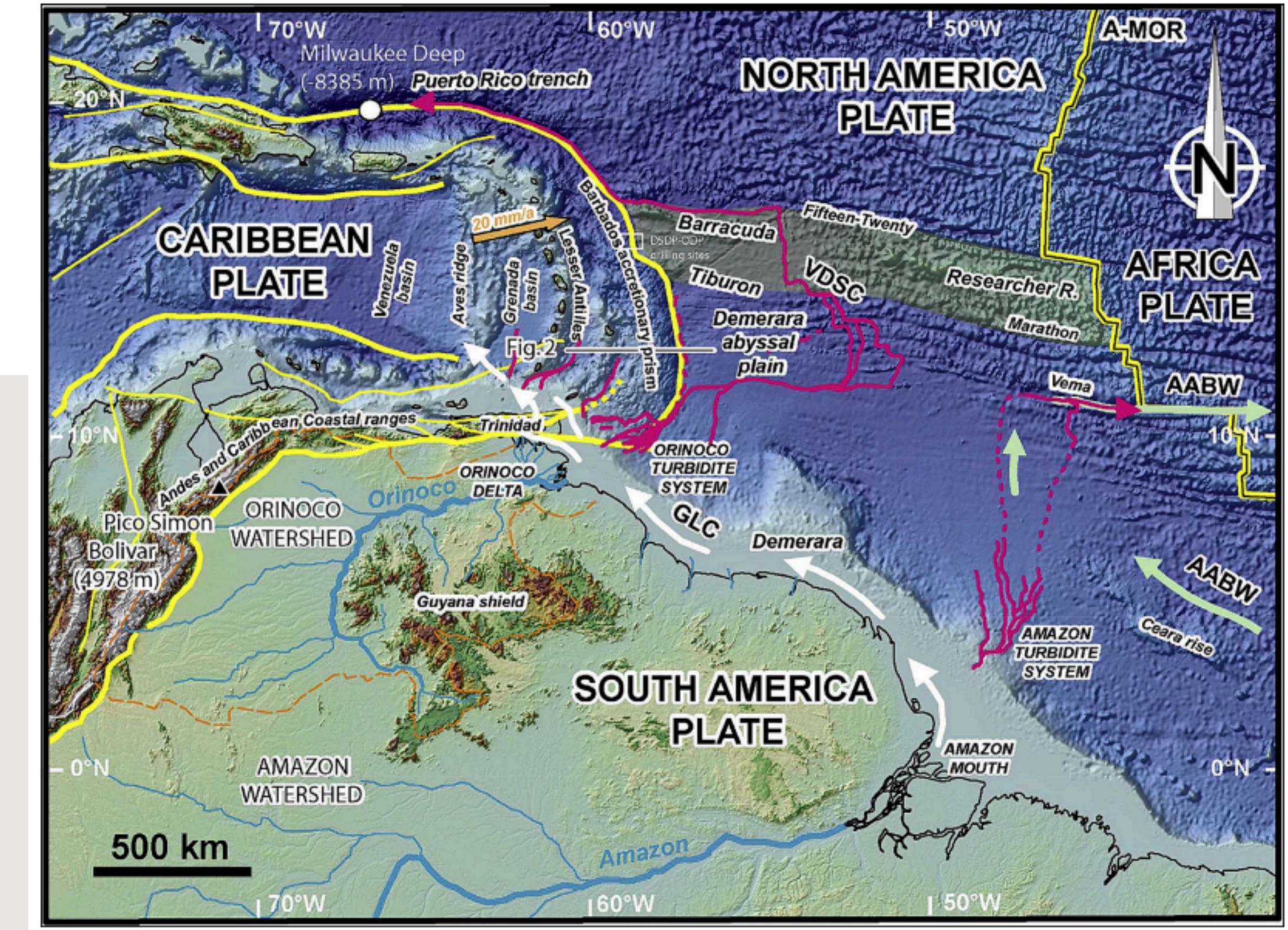


# Historical Views on the Plate Boundary Location

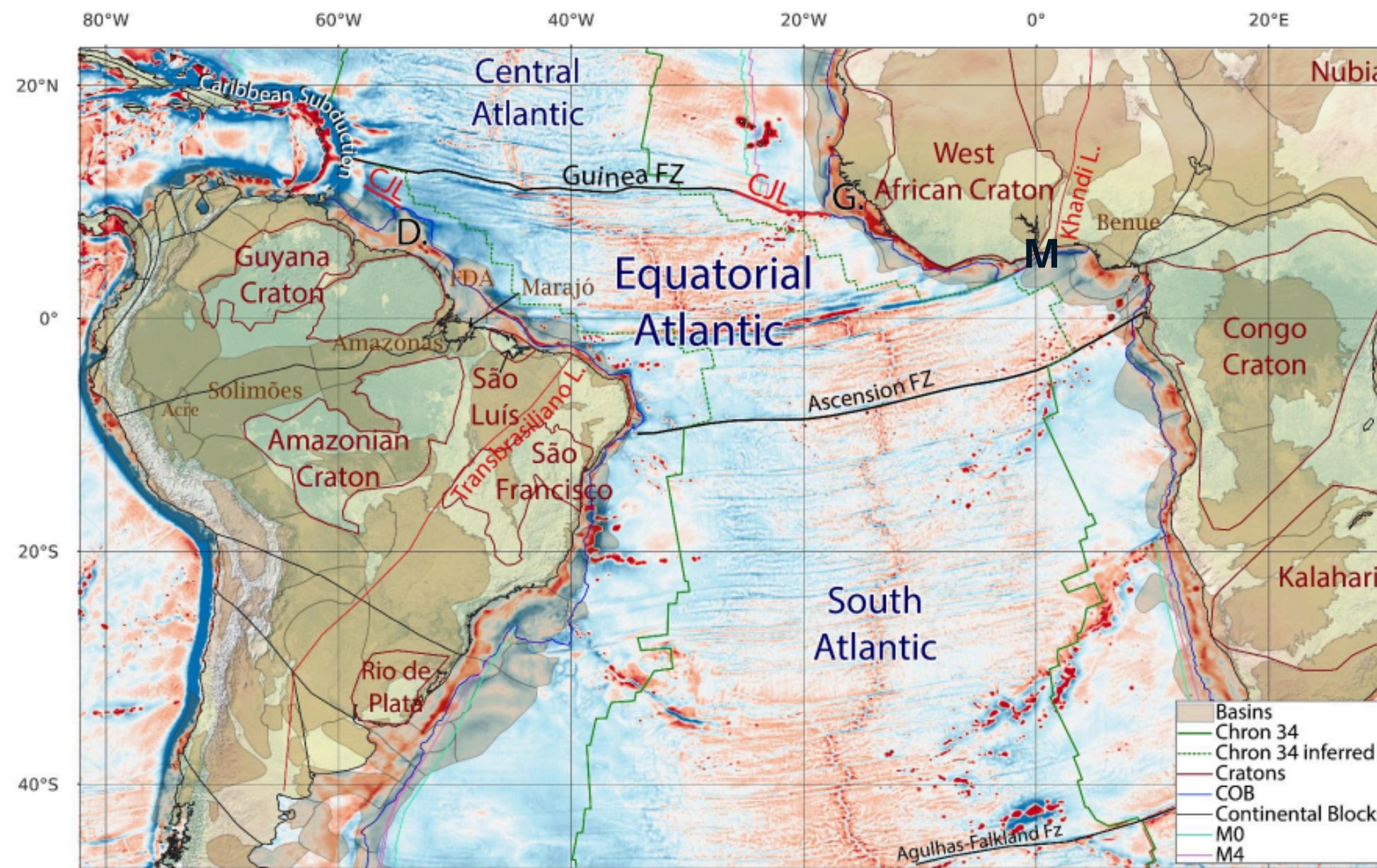


From Deville et al. (2015)

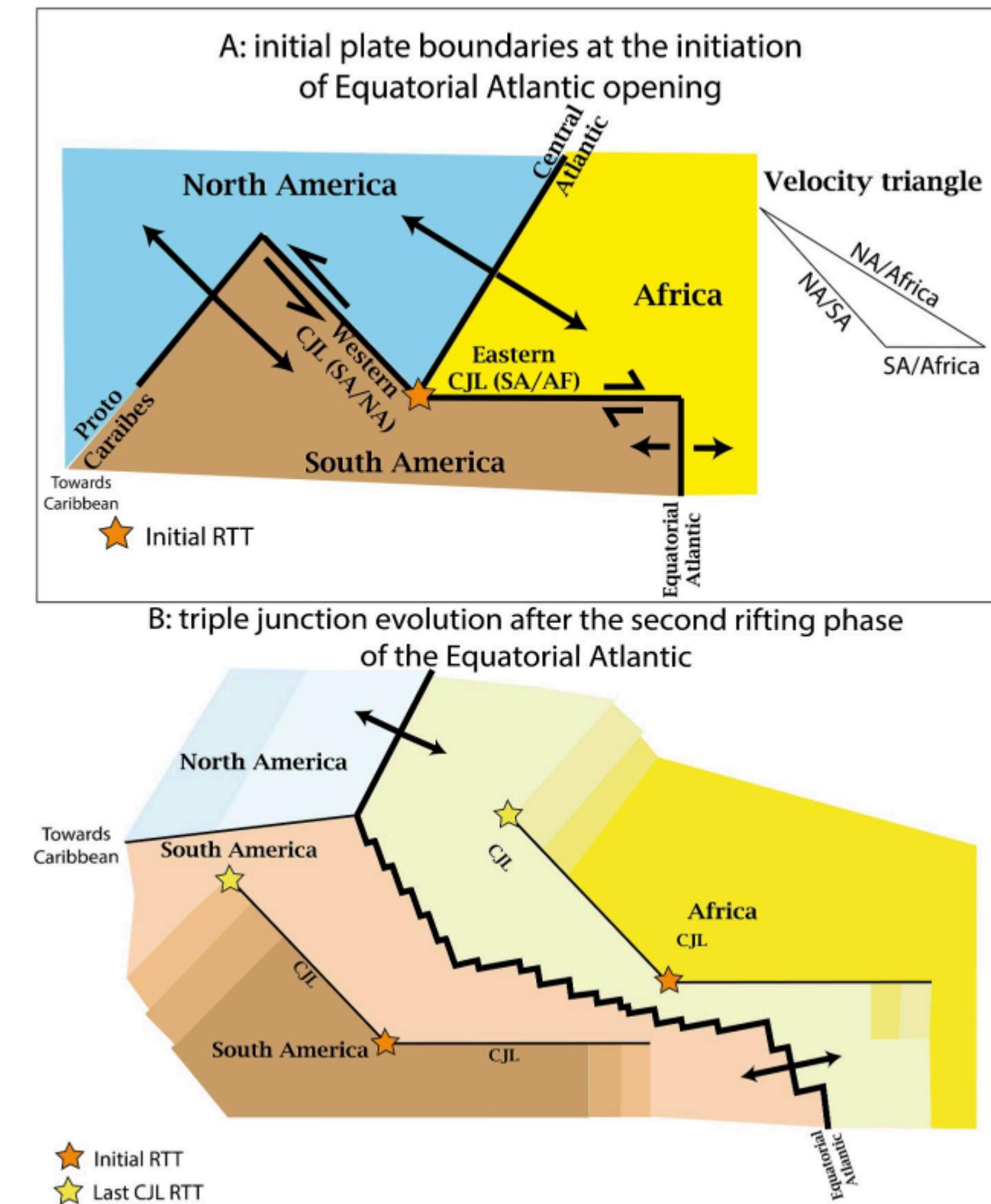
- Ball & Harrison (1970): Near 20°N
- Vogt & Perry (1981): Closer to 13°N
- Le Douaran & Francheteau (1981): Also near 13°N
- Roest & Collette (1986): Proposed northward migration from ~8°N to ~16°N (around 7 Ma)
- Patriat et al. (2011); Deville et al. (2015): Described the present-day boundary as a broad deformation zone, ~200 km wide, involving features like the Barracuda Ridge and Tiburon Rise

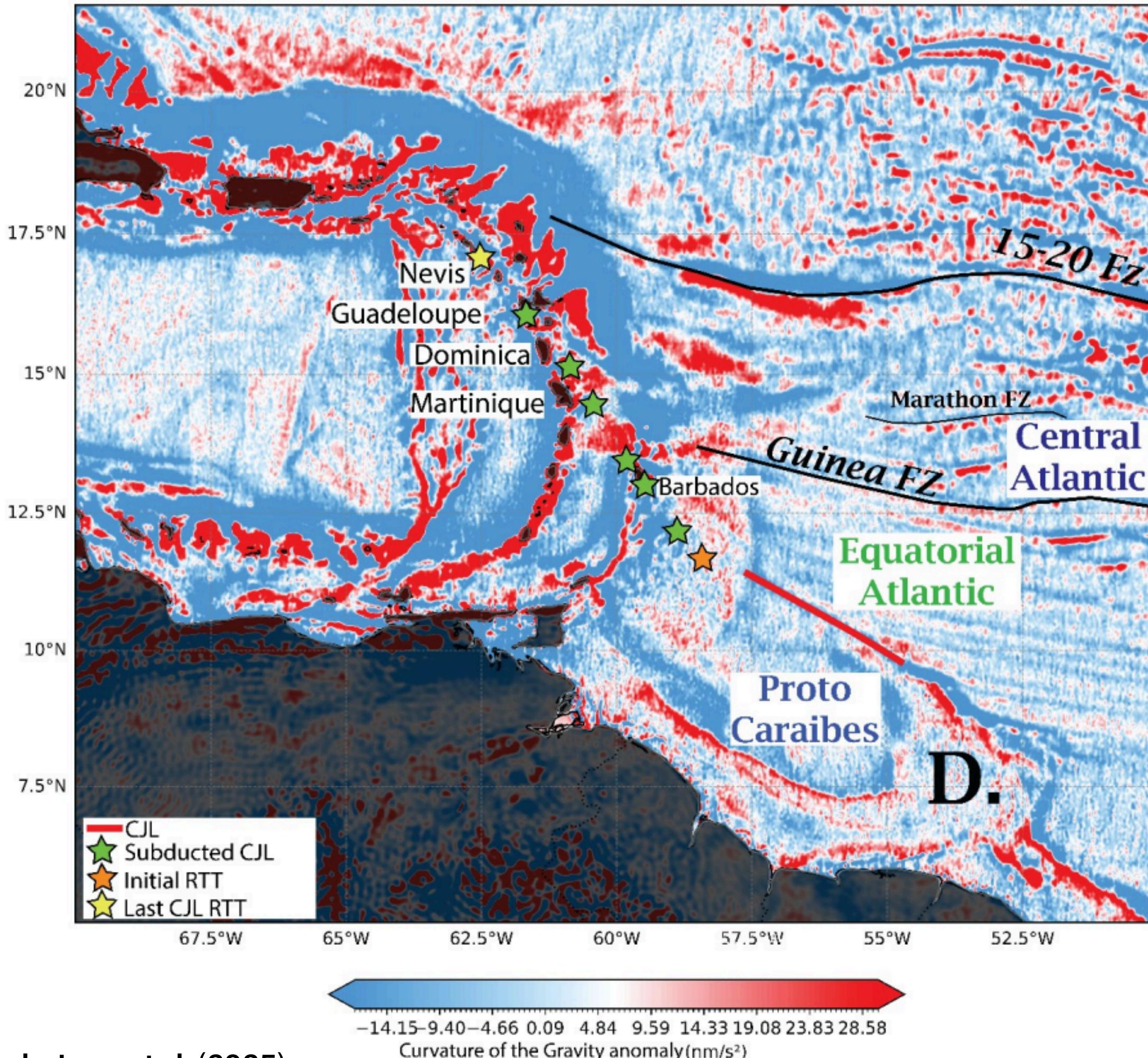


# Revisiting the Boundary: Insights from the Demerara Plateau



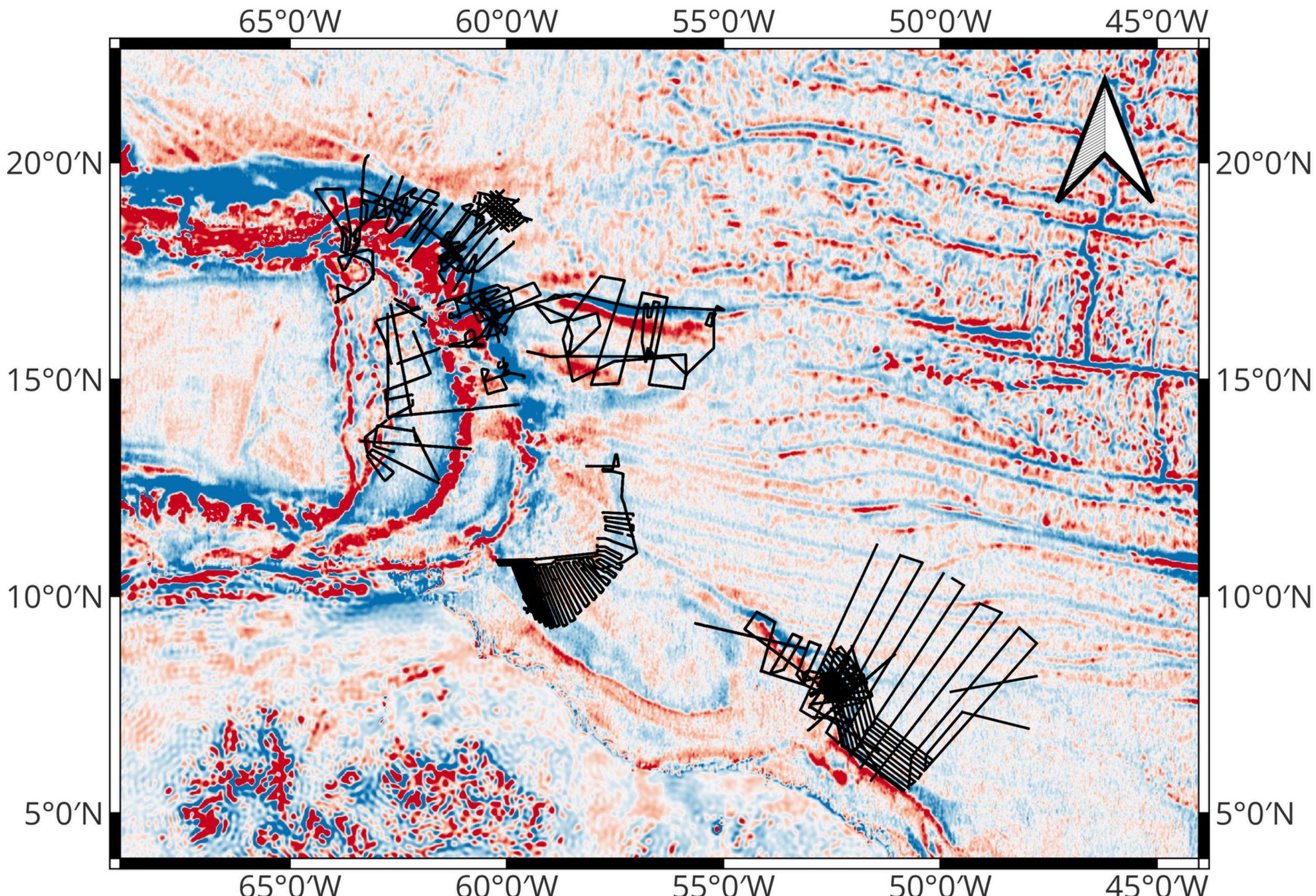
From Lesourd—Laux et al. (2025)

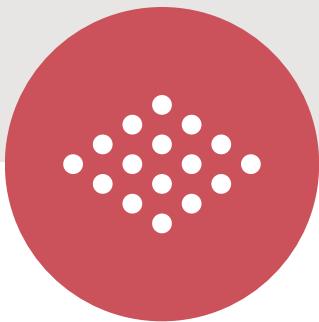




# Internship Goals and Current Work

- 1) Calculate **Bouguer gravity anomalies**
- 2) Apply **edge detection** to identify structural boundaries
- 3) Machine learning project
- 4) Integrate **2D gravity model** with existing **seismic profiles** and **earthquake data**





>>> **THANK  
YOU!** <<<

# References

- E. Deville et al. "Tectonics and sedimentation interactions in the east Caribbean subduction zone: An overview from the Orinoco delta and the Barbados accretionary prism". In: *Marine and Petroleum Geology* 64 (2015), pp. 76-103. doi: [10.1016/j.marpetgeo.2014.12.008](https://doi.org/10.1016/j.marpetgeo.2014.12.008).
- Lesourd—Laux, T., Basile, C., Roest, W., Klingelhoefer, F., Zahirovic, S., Wright, N. M., et al. (2025). New kinematic model of the early opening of the Equatorial Atlantic Realm. *Tectonics*, 44, e2024TC008713. <https://doi.org/10.1029/2024TC008713>

