



# Did Rock Metamorphism Cause a Mass Extinction?

Dr. Emily Stewart, Isabelle Barta, Malia Hallway, Madison Walker  
Florida State Earth, Ocean, and Atmospheric Science Department



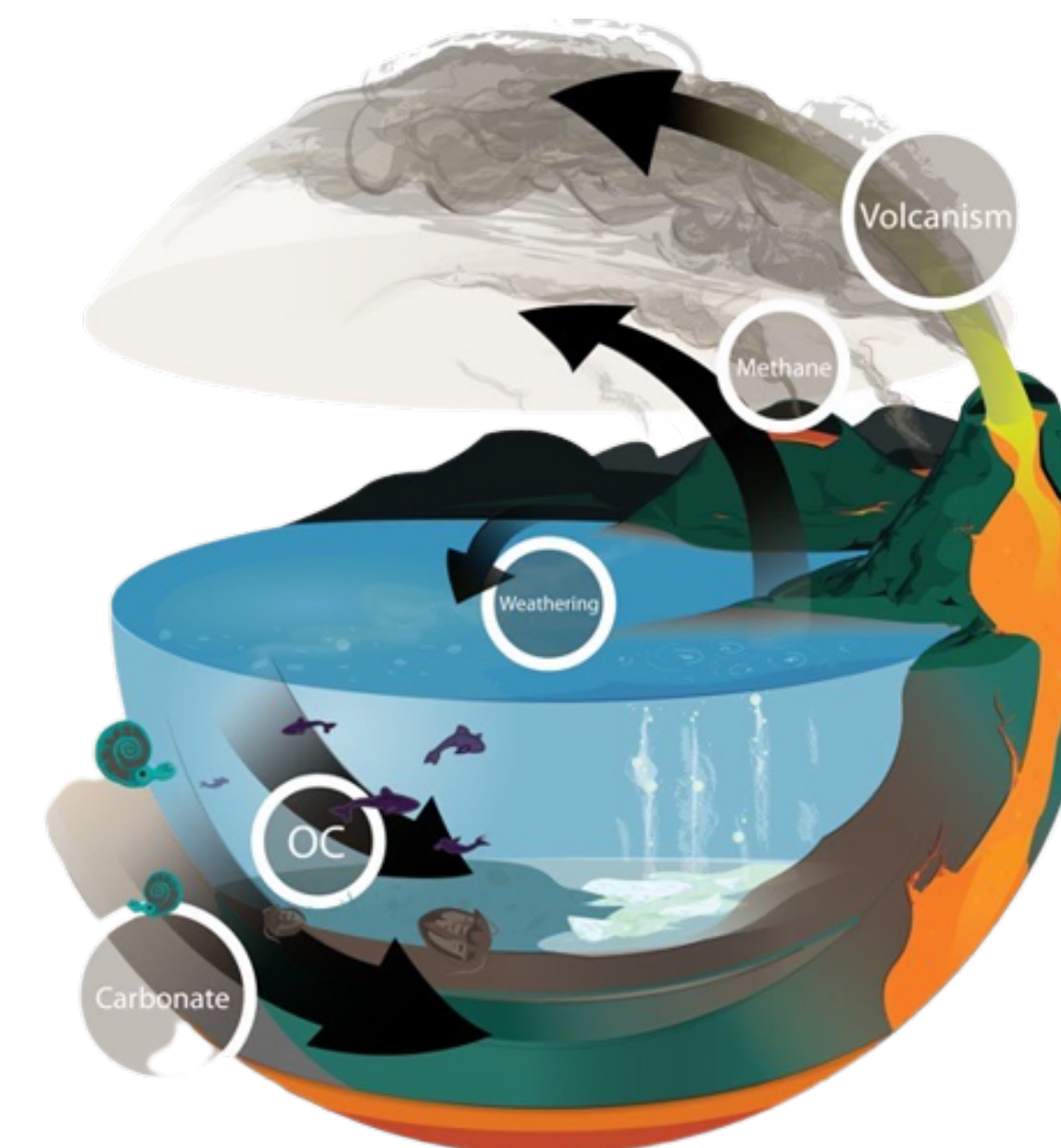
## Abstract

- The purpose of this study is to research a potential, but probable cause of the end-Triassic mass extinction event. It has been suggested that when carbon-rich rocks or sediments are heated up quickly it can affect global warming negatively as well as cause a mass extinction.
- We are focusing on samples that are found in the sills of the Central Atlantic Magmatic Province (CAMP) that are found underground in the elbow of Florida. These samples have come from the Florida Geologic Survey and will be used to test the deep carbon release of metamorphism in rocks.
- We looked at files from the geologic survey to identify the wells that intertwine with CAMP sills, then we look at the thin sections of the rocks found in the wells, then we did computer programming to calculate certain values at different temperatures and pressures of our rock equation, and then we did chemical analysis of the rocks in the MagLab.
- So far, there are no results to report, however, this project is ongoing

## Introduction

- What if a mass extinction could happen due to rock metamorphism? The mass extinction that we studied is the end-Triassic.
- It has been suggested that when carbon-rich rocks or sediments are heated up quickly it can affect global warming negatively as well as cause a mass extinction.
- We have focused on samples that are found in the sills of the Central Atlantic Magmatic Province (CAMP) that are found underground in the elbow of Florida.
- These samples have come from the Florida Geologic Survey and will be used to test the deep carbon release of metamorphism

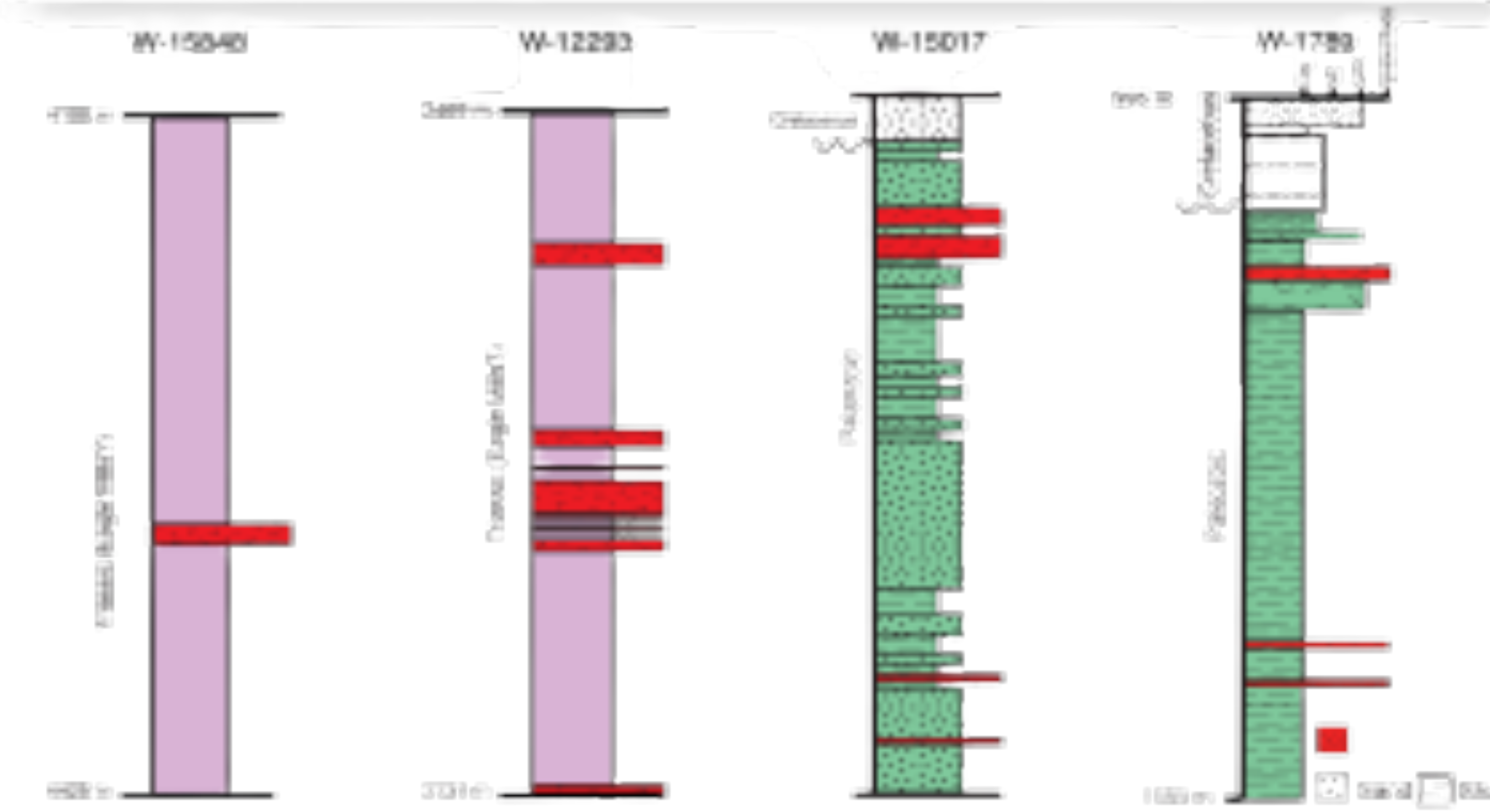
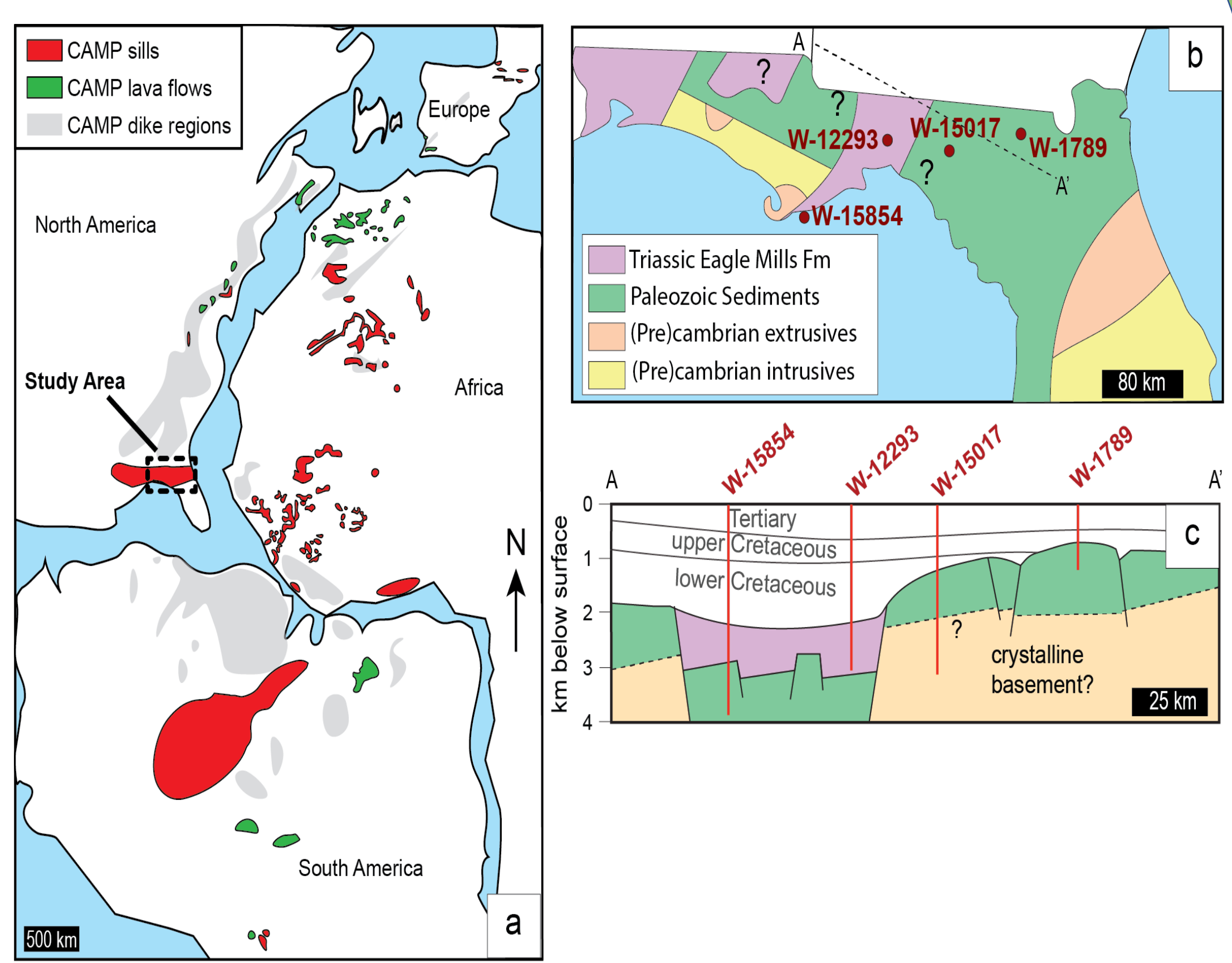
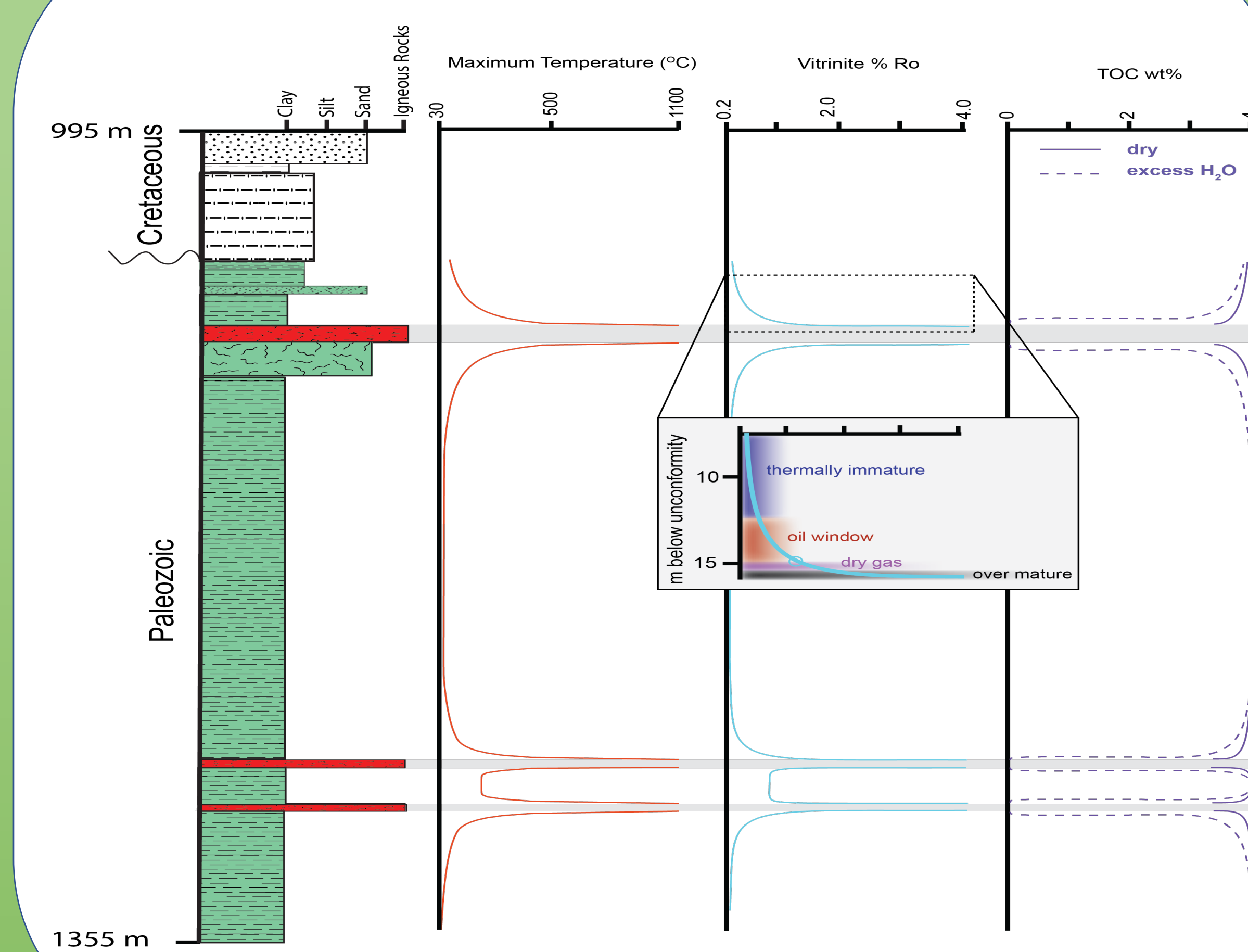
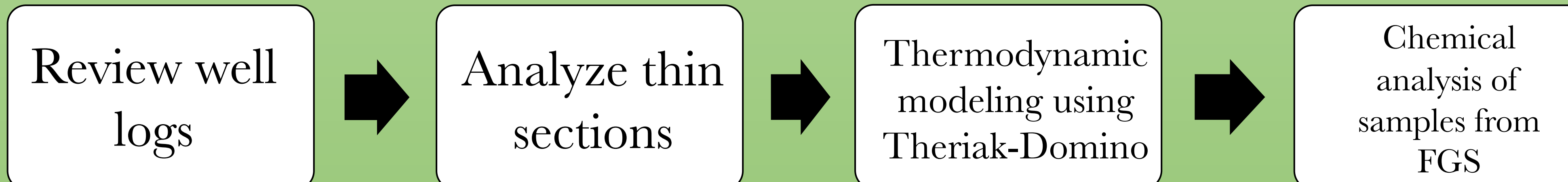
## Earth's Carbon Cycle



## Discussion

There are currently no results for this research yet. However, the results would be ongoing as there are many different magnitudes in which this research problem can be studied. There is also a large amount of modeling that went into this research. However, instead of modeling, analyzing a larger sample size of rocks would be beneficial to gain a more accurate perspective on this research. This area of interest is significant because it allows us to research other mass extinctions and look at their causes more broadly.

## Methods



## References

R. S. Barnett, Richard. "Basement Structure of Florida and Its Tectonic Implications." *AAPG Bulletin*, vol. 59, 1975, <https://doi.org/10.1306/83d92050-16c7-11d7-8645000102c1865d>.

Heimdal, Thea H., et al. "Large-Scale Sill Emplacement in Brazil as a Trigger for the End-Triassic Crisis." *Scientific Reports*, vol. 8, no. 1, 2018, <https://doi.org/10.1038/s41598-017-18629-8>.

Hesselbo, Stephen P., et al. "Terrestrial and Marine Extinction at the Triassic-Jurassic Boundary Synchronized with Major Carbon-Cycle Perturbation: A Link to Initiation of Massive Volcanism?" *Geology*, vol. 30, no. 3, Mar. 2002, p. 251., [https://doi.org/10.1130/0091-7613\(2002\)030<0251:tameat>2.0.co;2](https://doi.org/10.1130/0091-7613(2002)030<0251:tameat>2.0.co;2).

Stewart, Emily. "Carbonation and Decarbonation Reactions: Implications for Planetary Habitability." *American Mineralogist*, 2019, <https://doi.org/10.2138/am-2019-6884ccbnyend>.

Suarez, Celina A., et al. "Earth Catastrophes and Their Impact on the Carbon Cycle." *Elements*, 18 May 2021, <http://elementsmagazine.org/2019/10/02/earth-catastrophes-impact-carbon-cycle/>.