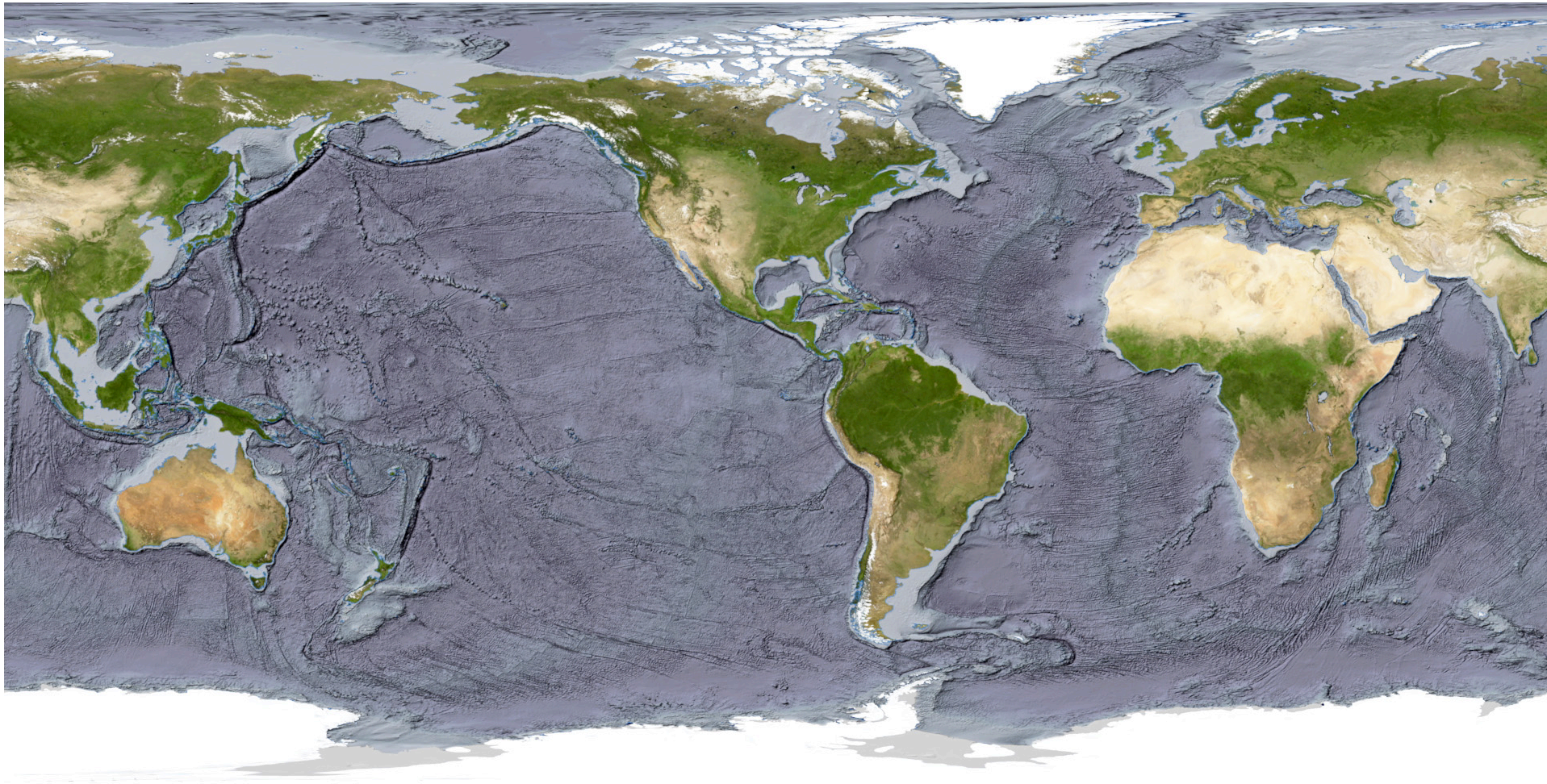
PLATE DETECTIVE

Let’s find plate boundaries from scientific evidence!

TCU IDEA FACTORY

Sea Floor Map

How does a map of the sea floor reveal evidence for the location of plate boundaries?
Use this data to create a model of plate boundaries.

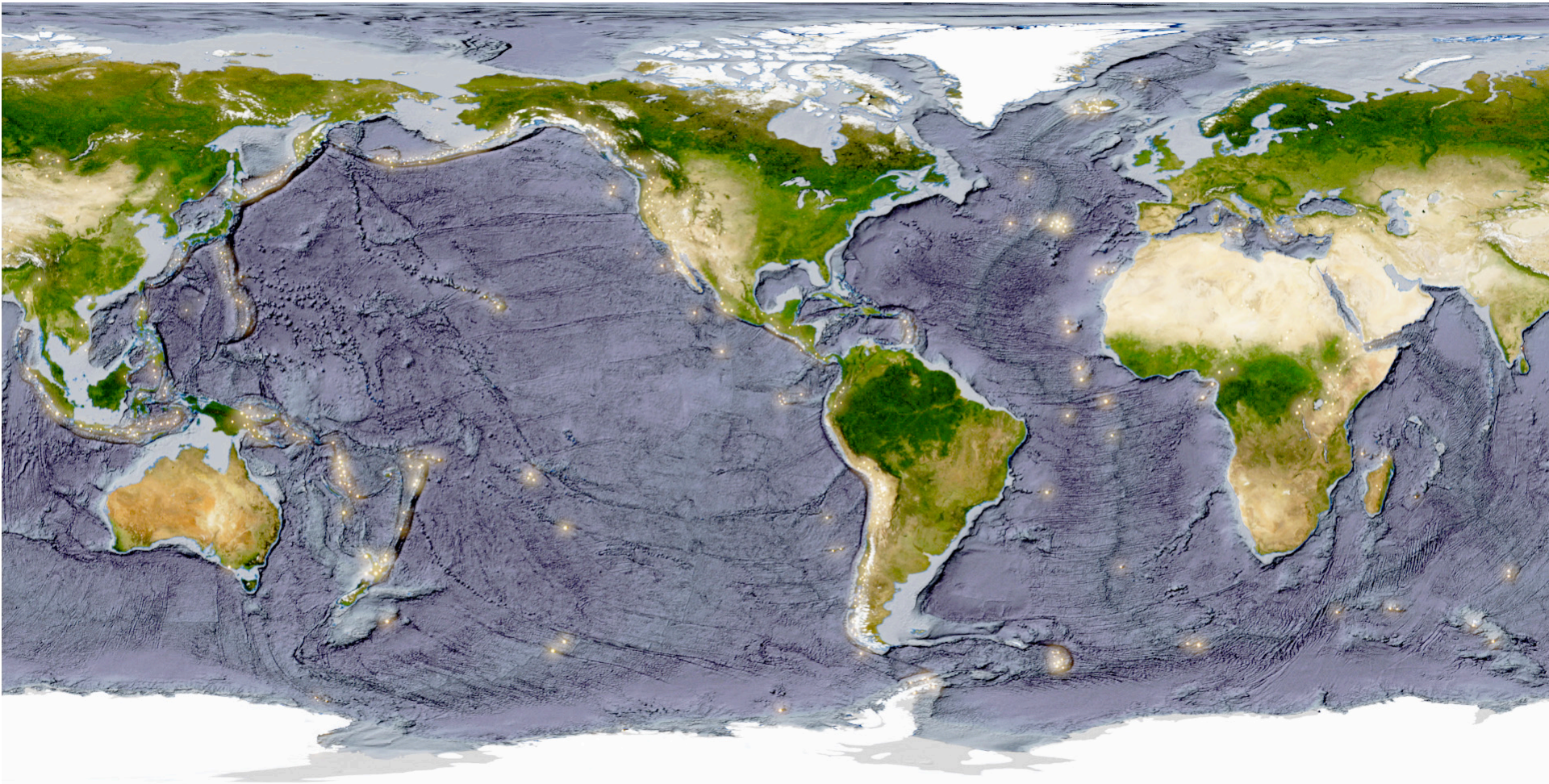


How would knowing whether the map feature was a ridge or trench lead us to predict the type of plate boundary?

Volcano Data Set

How does a map of volcanoes reveal evidence for the location of plate boundaries?
Use this data to create a model of plate boundary locations and types.

PLATE DETECTIVE



How do we explain the location of isolated volcanoes (like the Hawaiian Islands) in the model?

Can the uneven distribution of volcanoes on the planet—concentrated in the ring of fire—lead us to predict the type of boundary?

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Earthquake Data Set

How do earthquakes provide evidence for the location of plate boundaries? Earthquakes that occurred at shallow depths are shown in yellow. Deep earthquakes are shown in red. Use this data to create a model of plate boundaries.

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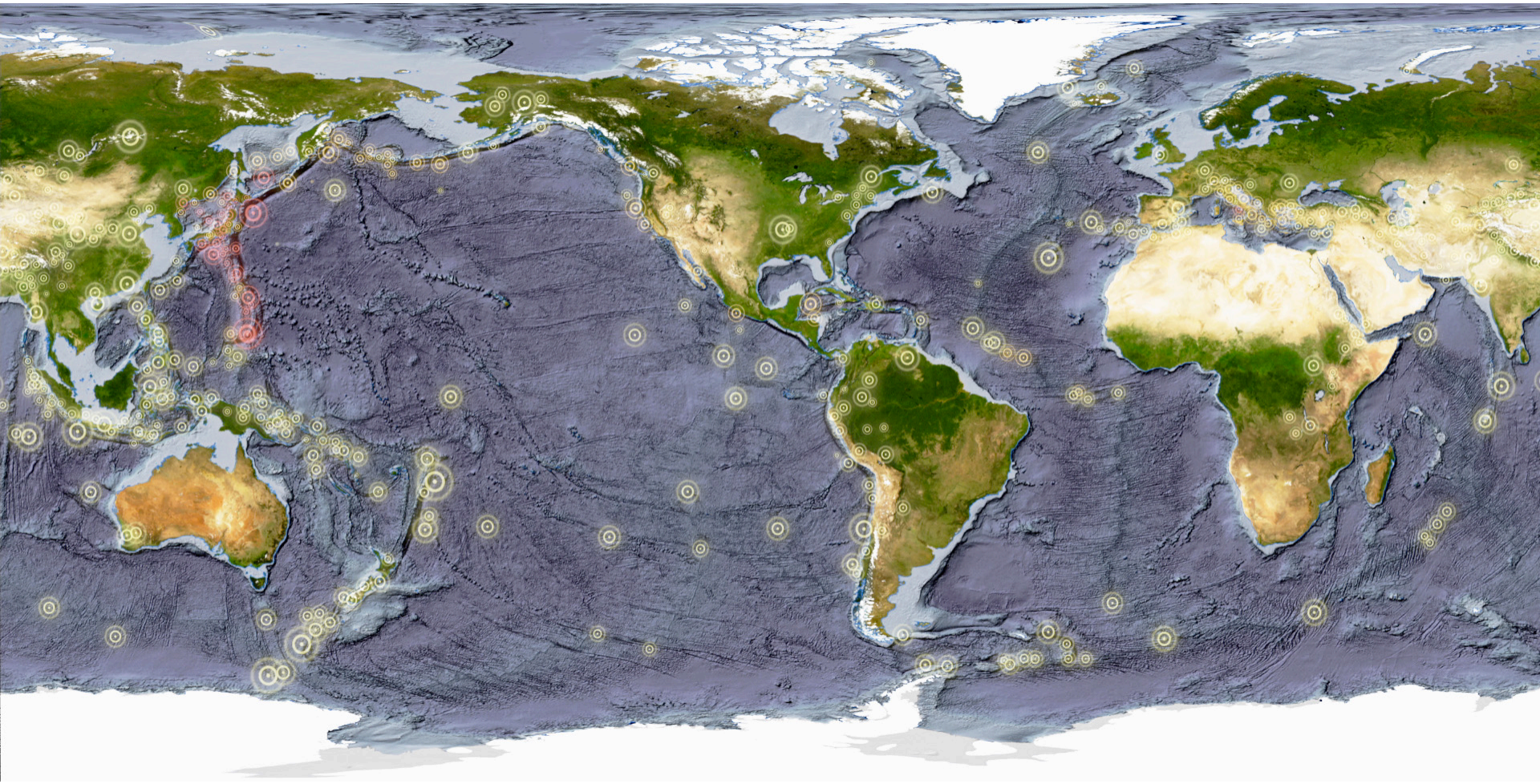

Can we use the depth information to predict the type of plate boundary?
Should the model accommodate all of the earthquake data?
How do we explain data that does not fit easily into the model?

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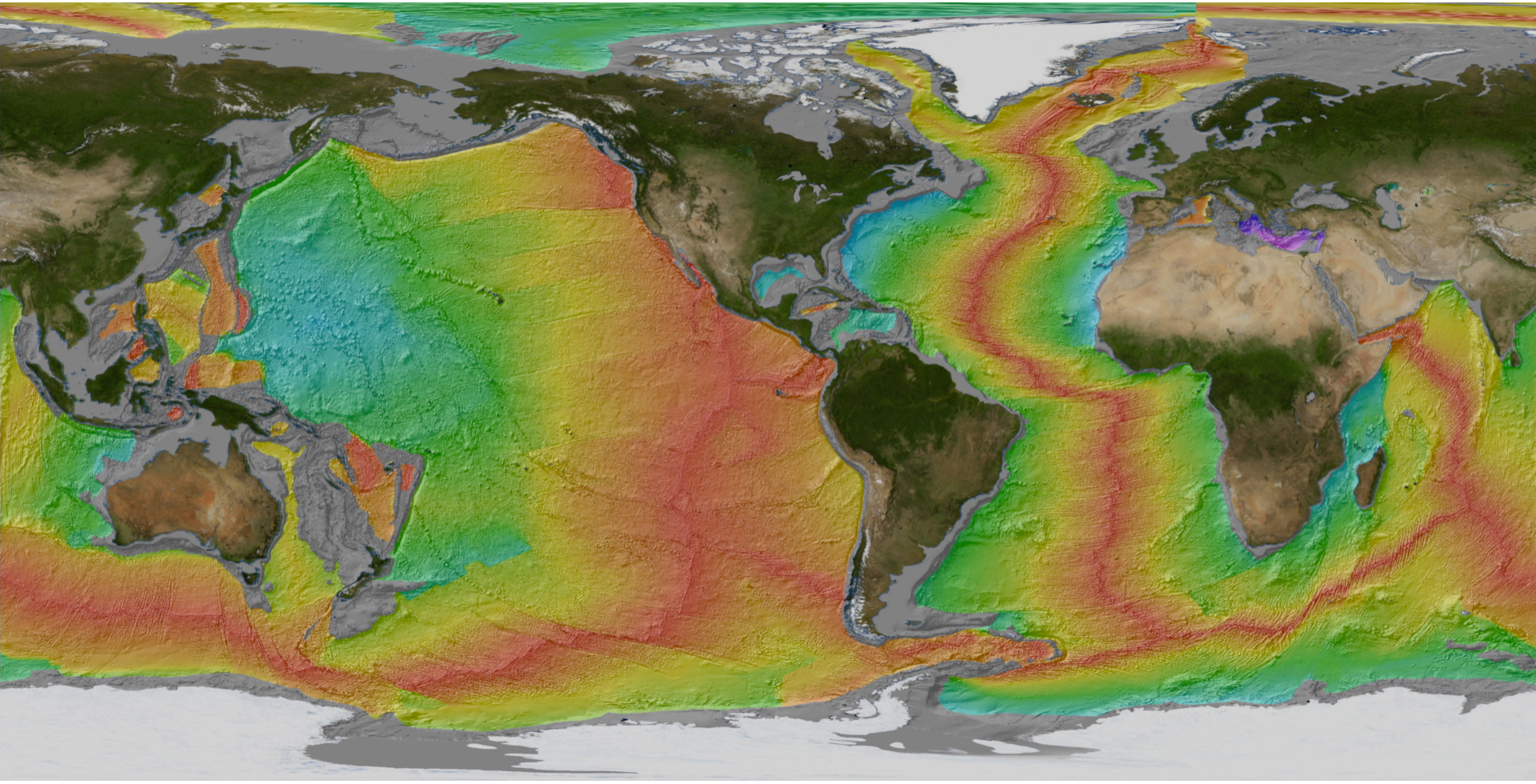
Sea Floor Age

How does a map of the age of the sea floor reveal evidence for the location of plate boundaries? Use this data to create a model of plate boundary locations and types.

- 0-10 million years old
- 20-30 million years old
- 40-50 million years old
- 80-90 million years old
- 100-160 million years old
- 180-280 million years old

PLATE DETECTIVE



Can we identify different types (convergent, divergent, transform) of plate boundaries? Consider the Atlantic and Pacific coasts of North America. What does the difference in width of the red/orange/yellow regions tell us?

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Magnetic Patterns

How does a map of magnetic patterns reveal evidence for the location of plate boundaries?

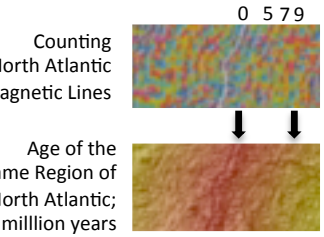
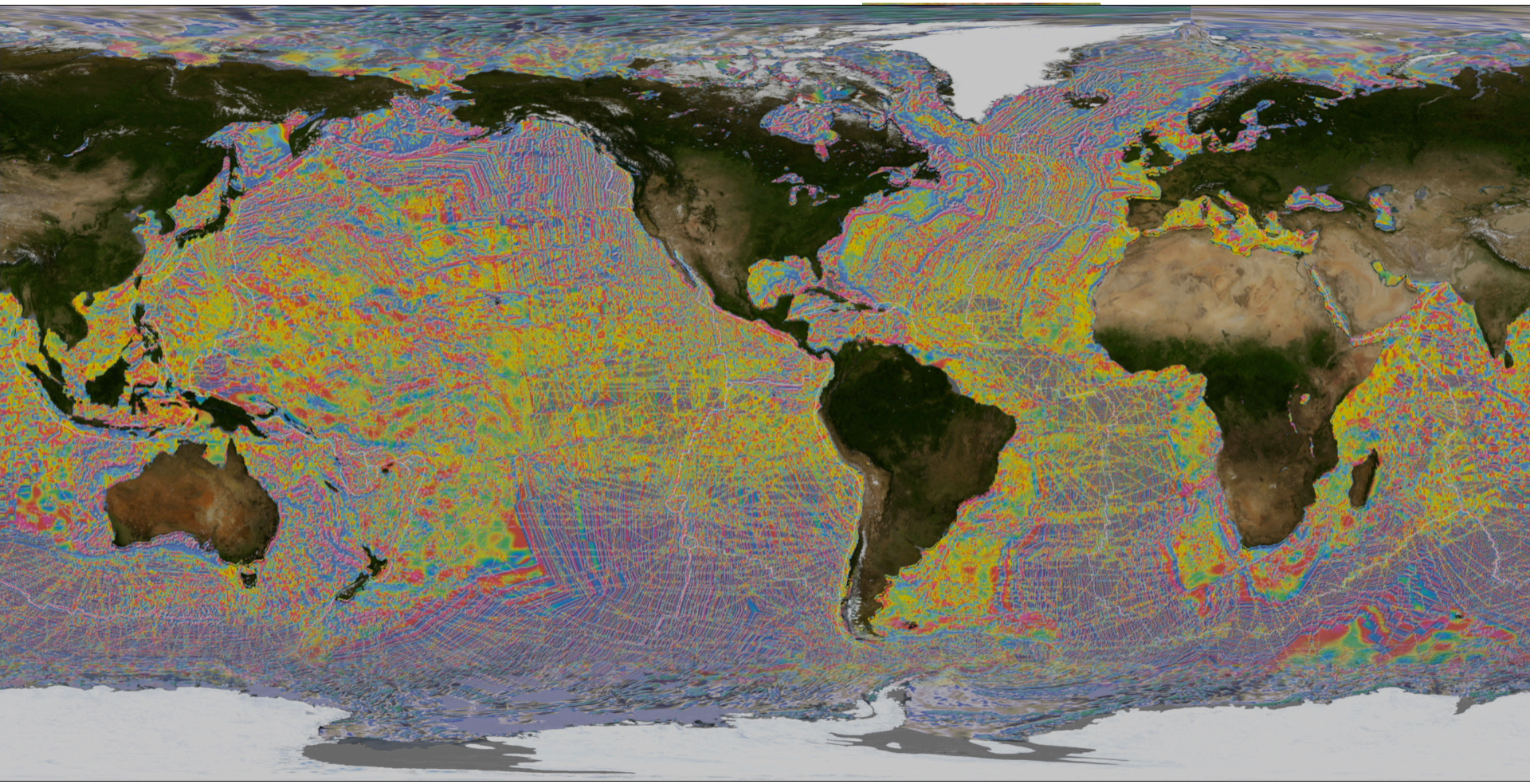


PLATE DETECTIVE



Why is it fortunate that the first data was collected in the North Atlantic?
What does the direction and symmetry of the banding pattern in the North Atlantic reveal?
How can we estimate the time of a magnetic pole reversals? See the inset for a hint.

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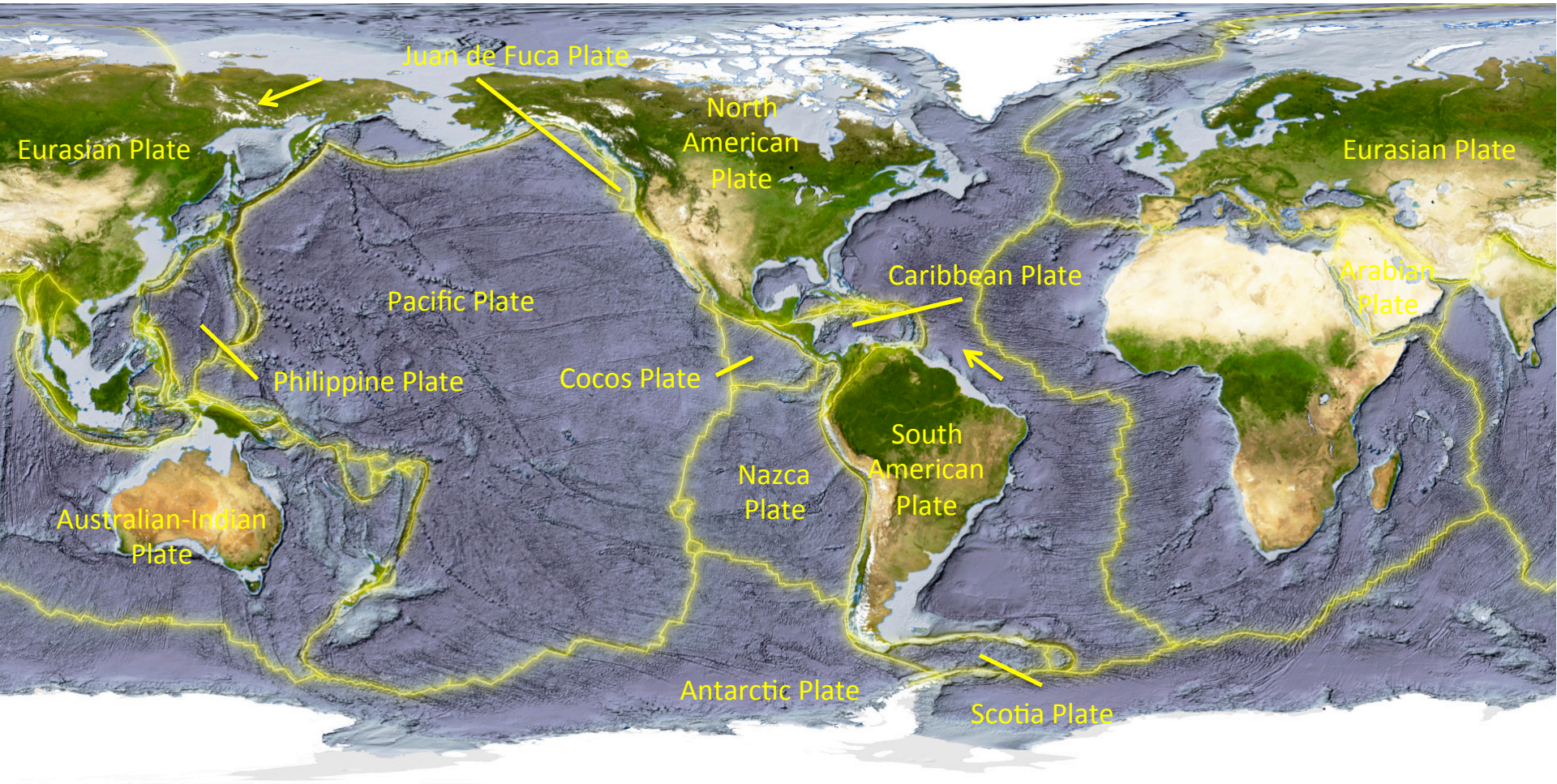
Current Boundary Map

How does the currently accepted map of plate boundaries fit with the model we created?



Models are based on data. Models are the product of the scientific method. Observations lead to hypotheses. Hypotheses lead to experiments. Models are not "reality". Models help organize the way that we think about things. Models are not always 100% accurate or complete. Look at at the yellow arrows. What is missing and why?