

A satellite image of Earth showing the Atlantic Ocean, North America, and parts of Europe and Africa. The ocean is a deep blue, while the continents are in shades of green and brown. Clouds are visible as white streaks over the ocean and parts of the land.

PART III

The Tectonic System

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In this part of the book, we present the details of Earth's tectonic system. The tectonic system creates Earth's large scale structure—the continents and ocean basins. It is driven by internal heat, largely generated by radioactivity inside the Earth. As this heat is lost, a series of huge convective systems is set up inside the core and the mantle. Even the lithosphere participates in the convective churning as new lithosphere is created at ridges and consumed at subduction zones. We explore in detail the evidence for plate tectonics and ponder the mechanisms that drive huge plates for thousands of kilometers over billions of years. You will learn how Earth's oceanic crust and its continents formed by slow separation of material from the mantle. Moreover, you will examine how earthquakes, volcanoes, mountains, landforms, and even the microscopic features of many kinds of rocks, are all related to plate tectonics.