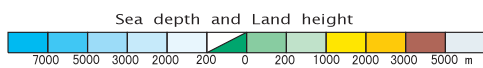
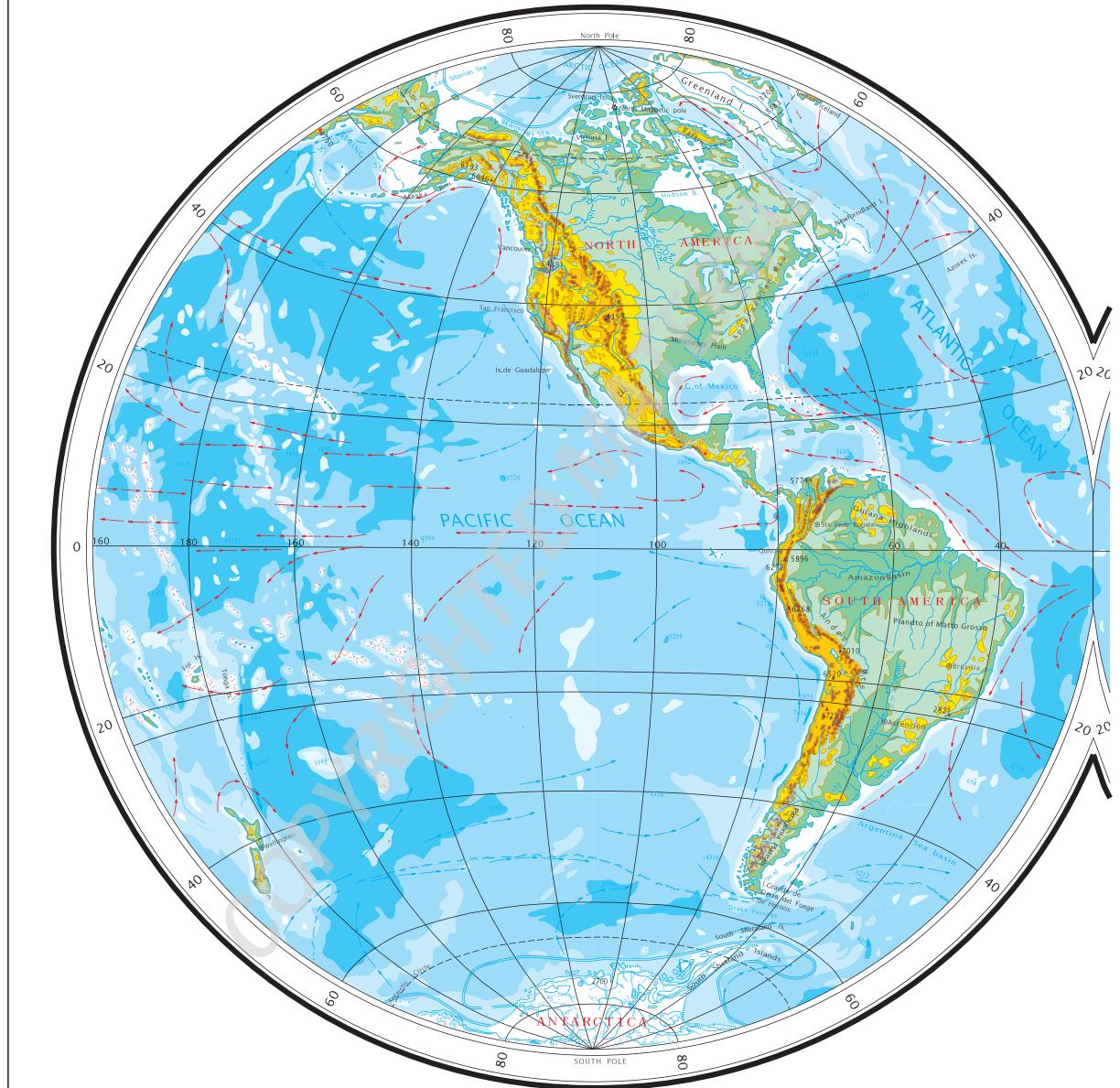
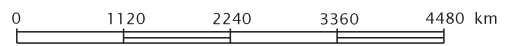
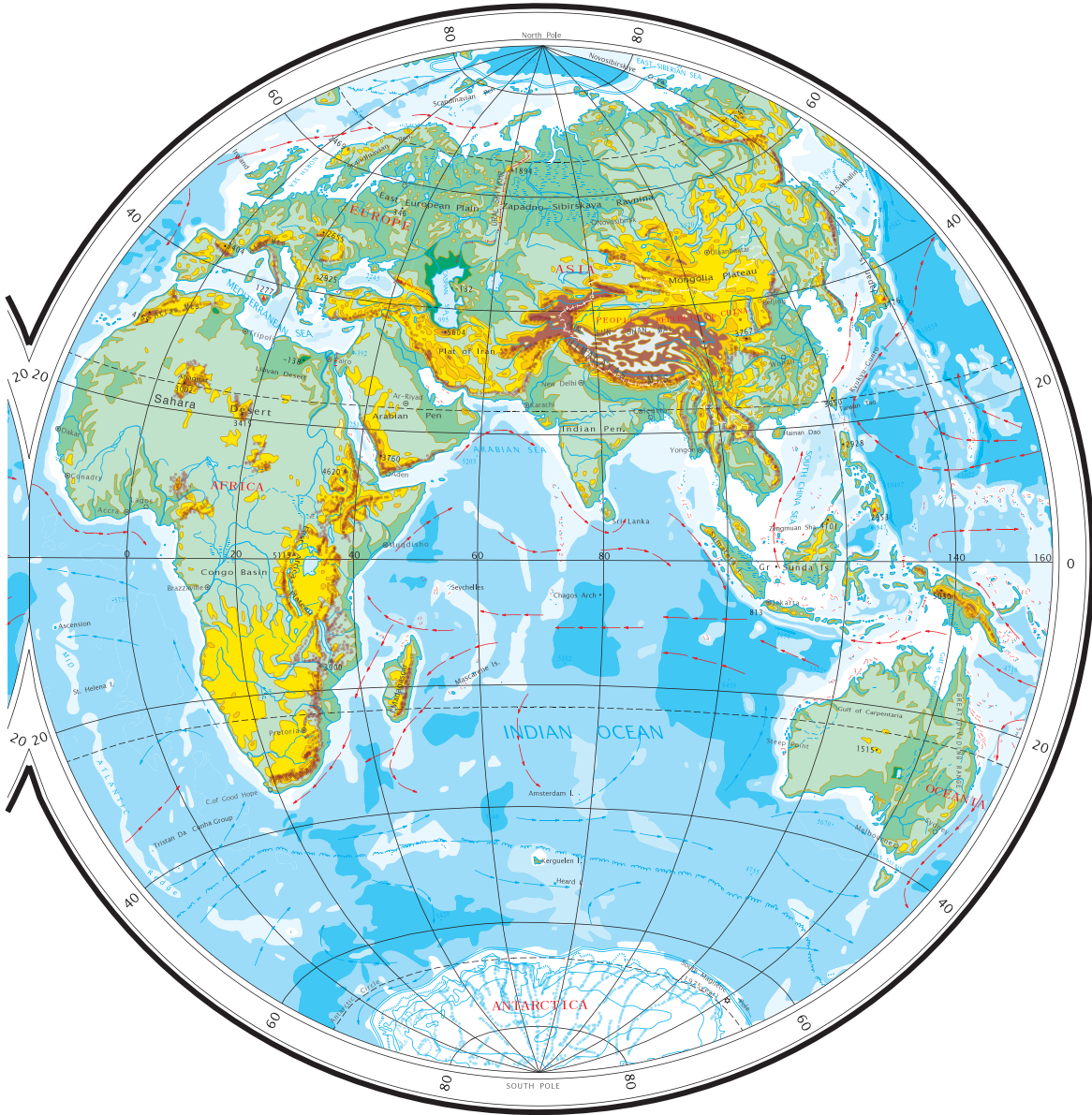


# WORLD TOPOGRAPHY



# CHAPTER 1



# 1 World Topography

## Oceans and continents

Earth has an area of about 510 million km<sup>2</sup> (197 million square miles). Of this total, approximately 360 million km<sup>2</sup> (140 million square miles), or 71 per cent, are represented by oceans and marginal seas. The continents comprise the remaining 29 per cent, or 150 million km<sup>2</sup> (58 million square miles).

**Land** With an average altitude of about 875 m, land can be classified into continents, islands and peninsula. There are six mainland masses, namely: Eurasia, Africa, North America and South America, Antarctic, and Australia. Islands that are located near each other are called an archipelago.

**Oceans** Oceans refer to broad and continuous bodies of saline (salty) water on the Earth's surface. They are 3795 m deep on average. There are four oceans on Earth, namely, the Pacific, the Atlantic, the Indian and the Arctic. Seas are the smaller subdivisions of oceans. The largest sea in the world is the Coral Sea located off northeastern Australia with an area of 4.79 million km<sup>2</sup>. Seas can be further divided into marginal seas, inland seas and intercontinental seas. Inland seas refer to those seas that extend onto mainland masses and which may connect with marginal seas or even with oceans by narrow waterways. The Bohai Sea and the Baltic Sea are illustrations of this type. A third common type of sea, the intercontinental, separates two or more continental land masses. The Mediterranean Sea is an example of this type.

## Land and submarine topography

**Land** The surface of the Earth varies greatly in height and morphology. Using these two features as defining parameters, land presents itself in five forms: plains, mountains, plateaus, hills and basins.

A plain is a broad area of land with relatively low relief that has no cliffs at its edges. Plains are mostly less than 200 m in altitude and account for just under 35 per cent of the total land area. The largest plain in the world is the Amazon with an area of about 5.6 million km<sup>2</sup>.

Mountains are often spectacular features that rise several hundred metres or more above the surrounding terrain. Mountainous areas have large altitudinal variations, steep slopes and great heights. Linearly extensive mountains are called mountain ranges. Adjacent mountain ranges that share similar genesis are called mountain systems. These ranges are mostly distributed in two main belts in the world. One belt comprises the south–north trending coastlines along both sides of the Pacific Ocean. It runs continuously from the tip of South America through Alaska, to ranges in Asia, the coastlines along Oceania as well as the Pacific Ocean, and islands outside marginal seas. The other is a belt that runs generally in an east–west direction, traversing Asia, southern Europe and northern Africa. This belt includes ranges in Java Island and Sumatra, the Himalayas, the Alps in southern Europe, and the Atlas in northwestern Africa.

Ranges in the above-mentioned belts are typically grand in scope and possess high peaks of above 4000–5000 m. There are 14 peaks with altitude of above 8000 m, most of them are distributed in the Karakorum and the Himalayas Ranges in Asia. Among these peaks, the Qumolangma (Everest) in the Himalayas at an altitude of 8848 m is the highest point in the world.

Plateaus refer to areas with moderately high elevations and relatively flat surfaces and edged by steep cliffs. The world's highest plateau is China's Tibetan Plateau with an area of 2.2 million km<sup>2</sup> and an average altitude of 4500 m. The world largest plateau in area is the Brazil Plateau (Mato Grosso) in South America. Its area is about 5 million km<sup>2</sup>.

A basin is a depression in the landscape, typically below the surrounding area, such as Sichuan Basin in China and the Congo Basin in Africa.

**Submarine landforms** The Earth's surface waters tend to obscure the true nature of submarine landforms. It is known that the submarine topography fluctuates as much as the visible landforms above sea level. Submarine topography can be described as consisting of the continental shelf, the continental slope and the ocean floor.

The continental shelf accounts for approximately 7.5 per cent of the Earth's total sea area. The continental slope is defined as the transitional belt between the continental shelf and the ocean floor. This type of slope is the world's largest. It has gentle inclines and relatively shallow water depths which would typically be no more than 200 m. There are, however, exceptions of up to 500–600 m. The difference in submarine elevation from the continental shelf to the base of the continental slope is about 3,000 m. The continental slope makes up about 12 per cent of the Earth's total sea area.

The ocean floor (also known as the seabed) typically refers to the extension of the continental slope and other continental margin features, such as the continental rise below sea level. the ocean floor is the main physical feature of the Earth's oceans, with depths of between 3000 m and 6000 m. In area, the ocean floor accounts for approximately 80 per cent of the Earth's total sea area.

Submarine topographical features vary greatly, with several different physical features such as ocean ridges, marine basins, ocean trenches, sea knolls, seamounts, and submarine plateaus, to name just a few.