

Our Country's Climatic Zones and Monsoon

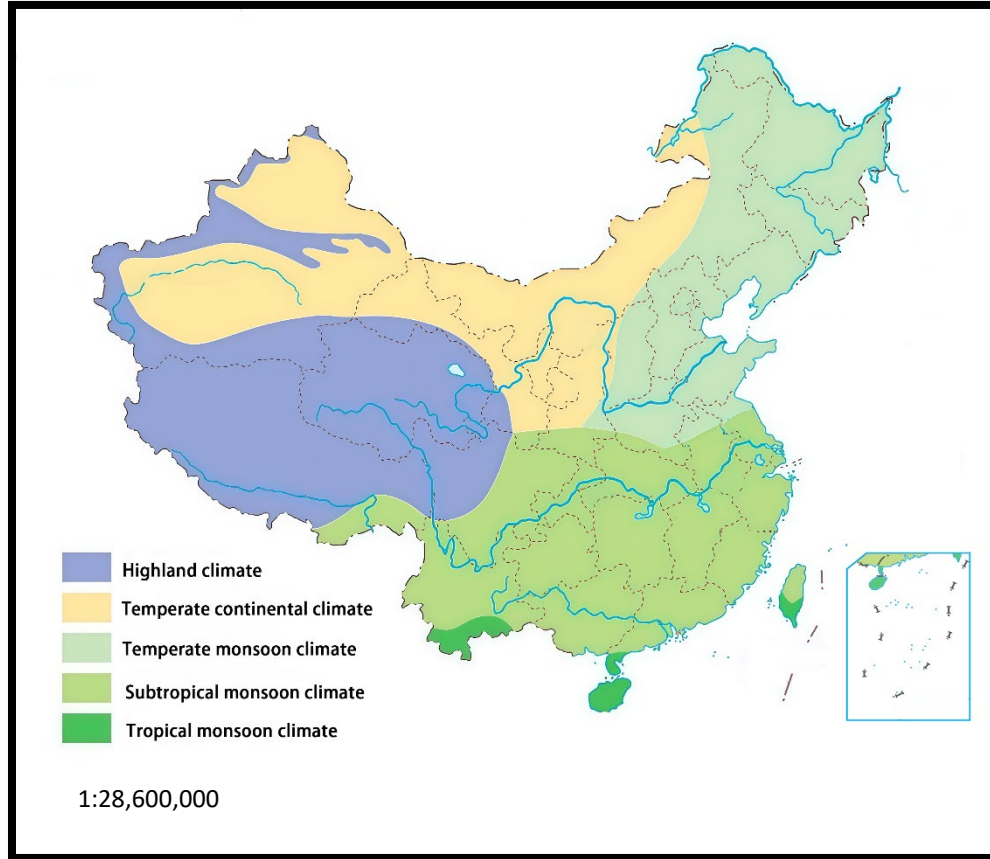
I. Overview

- Our country has a vast territory, with a nearly 50-degree difference in latitude between its northernmost and southernmost points, resulting in a diverse range of climate types. Additionally, our country's complex and varied terrain, along with the significant elevation differences across the "three-step-ladder-like" topography, further enhances the complexity and diversity of its climate.
- The distribution of temperatures in our country is primarily influenced by a combination of factors such as latitude, terrain, and the interaction between land and sea. In the eastern regions, where the terrain is relatively low, the impact of latitude is particularly pronounced, leading to a clear north-south temperature gradient. As latitude increases, temperatures gradually decrease from south to north. In contrast, in the western regions, where the terrain is dramatically varied, the influence of topography on temperature becomes more significant.
- Precipitation distribution in our country is highly uneven, gradually decreasing from the southeastern coastal areas to the northwestern inland regions. Correspondingly, the climate types also change, transitioning from the monsoon climate of the southeastern coast to the temperate continental climate of the northwestern interior.

II. Climatic zones in our country

- Our country has a diverse range of climate types, which mainly include tropical monsoon climate, subtropical monsoon climate, temperate monsoon climate, temperate continental climate, and highland climate (Figure 1). These climate types are widely distributed across the country, each with its own unique characteristics (中國人民共和國中央人民政府, 2005):

Figure 1: Climatic zones in our country



Map reference: 晉教版八年級上冊地理課本 (Date of reference: 30 June 2025)

- ◆ Tropical monsoon climate: It is characterised by high temperatures throughout the year, a long summer with no/short winter. The tropical monsoon regions receive abundant rainfall of over 2,000 mm p.a., with the maximum amount in high-sun season. It has distinctive wet-dry seasons which is related to the reversal of wind directions in different seasons. Tropical cyclones and low pressure trough also bring torrential rain in summer. This climate is mainly found along tropical latitudes between 10° and 20° on the eastern coasts of continents, including the Leizhou Peninsula, Hainan Island, the South China Sea, and the southern part of Taiwan Island.
- ◆ Subtropical monsoon climate: Winters are mild, summers are hot, and the four seasons are distinct. Annual precipitation typically ranges between 1,000 and 1,500 mm, with more rainfall in summer but no obvious dry season. Tropical cyclones and low pressure troughs bring torrential rain in summer days. Frontal rain occurs in winter. This climate is primarily distributed in the eastern part of our country, south of the Qinling

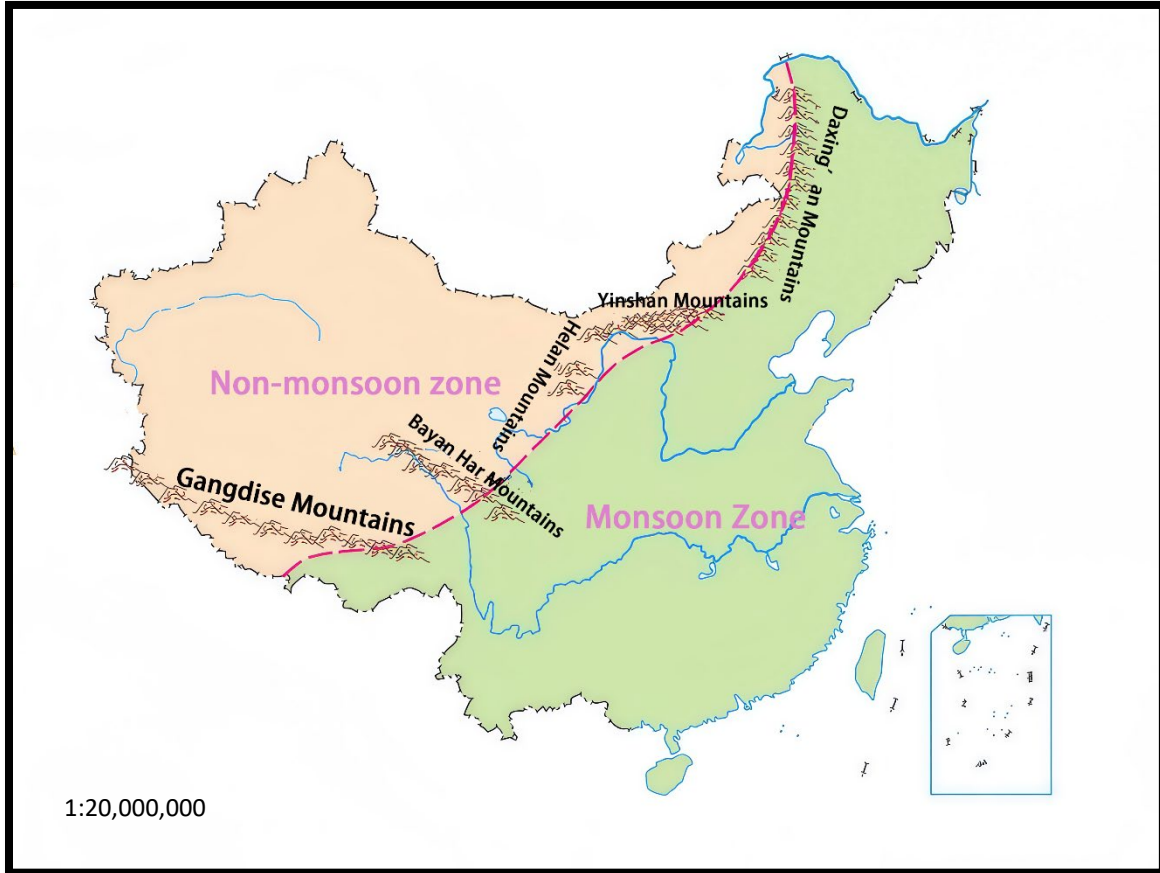
Mountains-Huai River line and north of the tropical monsoon climate zone.

- ◆ Temperate monsoon climate: Summers are hot and rainy, while winters are cold and dry, with distinct seasonal changes. Snow falls in winter when frontal condition is active. This climate mainly occurs in the eastern part of our country, north of the Qinling Mountains-Huai River line, and in areas east of the temperate semi-arid and arid zones.
- ◆ Temperate continental climate: Marked by arid conditions and low rainfall, this climate exhibits extreme continental characteristics, with the largest annual and daily temperature variations among all climatic types. It is mainly found west of the Daxing'anling-Yin Mountains-Helan Mountains-Qilian Mountains-Bayan Har Mountains line and north of the Kunlun Mountains-Altyn Tagh Mountains-Qilian Mountains-Hengduan Mountains line.
- ◆ Highland climate: Winters are long, dry, and cold, while summers are cool and rainy, often accompanied by frequent hailstorms. The four seasons are not distinct, but there is abundant sunshine. Temperature decreases with rising altitude and latitude, with clear wet and dry seasons, and precipitation falls at night. This climate is primarily found in high-altitude areas such as the Qinghai-Tibet Plateau.
- These climate types not only have a profound impact on our country's agricultural production and residents' lifestyles but also play an important role in tourism. For example, the subtropical monsoon climate in the Chang Jiang Basin, with its distinct seasons, makes it suitable for tourism throughout the year. Meanwhile, the temperate monsoon climate in the northeastern regions, characterised by cold winters, sees its peak tourist season in spring and autumn.

III. Monsoon systems in our country

- Our country is located in the southeastern part of the Eurasian continent. Due to the different physical properties of land and sea, particularly in terms of thermal effects, the continent in Asia becomes a source of cold air during winter, forming a cold high-pressure system. Cold air spreads outward from the continent, forming cold and dry offshore NE / NW monsoon winds. In summer, the land heats up rapidly, forming a low-pressure system, and warm, moist air flows from surrounding oceans towards the low-pressure centre, forming warm and wet onshore SE / SW monsoon winds. This seasonal reversal of prevailing wind directions between winter and summer leads to distinct seasonal climate variations, which form the basis of our country's monsoon climate (Figure 2) (中國科學院地理科學與資源研究所, 2007).

Figure 2: The distribution of Monsoon and Non-monsoon zones in our country



Map reference: 晉教版八年級上冊地理課本 (Date of reference: 30 June 2025)

- The spatial distribution and temporal variation of precipitation in our country are primarily influenced by monsoon activity. The main monsoons affecting our country's precipitation are the East Asian monsoon, originating from the tropical waters of the western Pacific Ocean, and the South Asian monsoon, originating near the equatorial Indian Ocean. These monsoons transport warm, moist air to the Mainland, becoming the primary source of summer rain in our country (中國科學院地理科學與資源研究所, 2007).
- During winter, prevailing northerly winds blow from the continent towards the ocean, while in summer, prevailing southerly winds blow from the ocean towards the land. The winter monsoon originates from inland Asia and is characterised by cold, dry air. Under its influence, most regions of our country experience low temperatures and minimal precipitation during winter, with this pattern being particularly pronounced in the north.
- In contrast, the summer monsoon comes from the Pacific Ocean in the southeast and the Indian Ocean in the southwest. The warm and moist air brings precipitation, resulting in warm and wet summer. (中國科學院地理科學與資源研究所, 2007).

- Seasonal monsoon movement pathways in our country (中華人民共和國年鑒, 2023) :
 - ◆ In years of normal summer monsoon activity, in April and May, the warm, moist summer monsoon advances to the Nanling Mountains and areas to the south. Provinces/Autonomous region such as Guangdong, Guangxi, and Hainan enter the rainy season, with an increase in precipitation.
 - ◆ By June, the summer monsoon moves to the middle and lower courses of Chang Jiang, and the vast area south of the Qinling Mountains–Huai River line enters the rainy season. At this time, the Jianghuai region experiences continuous overcast and rainy weather. Since this period coincides with the ripening of plums, this weather is referred to as “plum rain.”
 - ◆ In July and August, the summer monsoon advances north of the Qinling Mountains–Huai River line, bringing the rainy season to regions such as the eastern and northeastern parts of our country, with a noticeable increase in precipitation.
 - ◆ By September, the influence of cold air from the north strengthens, pushing the warm, moist summer monsoon southward. The rainy season in the northern regions comes to an end.
 - ◆ From September to October, southwesterly airflows continue to transport moisture along the eastern side of the Qinghai-Tibet Plateau to the western part of our country. Meanwhile, cold air from the north begins to become active. The interaction between warm and cold air masses results in the formation of a stationary front in the western part of our country, leading to prolonged rainfall in areas such as southern Gansu, central and southern Shaanxi, Sichuan, Chongqing, Guizhou, and the western parts of Hunan and Hubei. This phenomenon is known as the “autumn rain in the western part of our country.” By mid to late October, as the autumn rain in the western part of our country concludes, the summer monsoon rain belt across the country disappears.

IV. Conclusion

Our country’s vast territory, complex terrain, and significant latitude differences give rise to a highly diverse range of climate zones. Our country’s climate is further shaped by its monsoonal systems, characterised by distinct seasonal variations in wind direction and precipitation. The movement of monsoons across the country plays a pivotal role in shaping seasonal rainfall patterns. This interplay between diverse climate zones and monsoonal systems underscores the complexity and dynamism of our country’s climate, affecting not only the environment but also the lives and livelihoods of its people.

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