

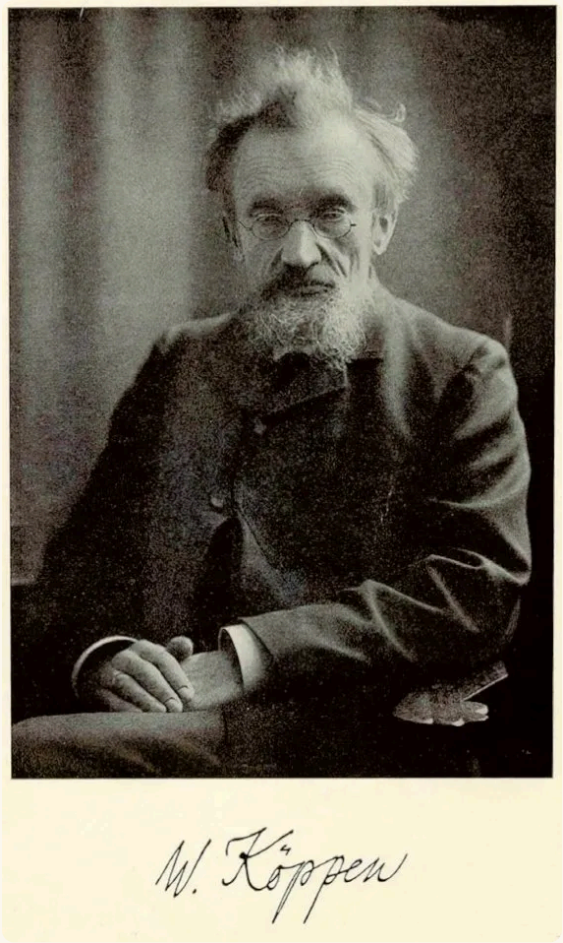
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Koeppen’s Scheme of World Climate Classification

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Koeppen’s Scheme of World Climate Classification

Brazil’s rainforest and India’s monsoon coast both get called “tropical.” Yet they feel very different on the ground. One scientist solved that mix-up with a single coded system.



Wladimir Koeppen (1846–1940), the scientist behind the climate code. Photo: unknown author, public domain, via Wikimedia Commons.

Five letters, one world of climate

Learn the capital letters first, the small letters add detail

01
A – Tropical

Coldest month averages 18°C or higher.

02
B – Dry

Evaporation exceeds precipitation here.

03
C – Warm Temperate

Coldest month between -3°C and 18°C.

04
D, E, H

> Cold snow-forest, cold, and highland climates.

Dry climate (B) The one Koeppen group defined by moisture balance, not temperature.
AmTropical monsoon climate, heavy summer rain, dry winter.
CsMediterranean climate, dry summer (hot in Csa, cooler in Csb), mild rainy winter.
Highland (H) Climate driven by elevation rather than latitude.

How Koeppen Classifies Climate

Must Know

Three Ways to Classify Climate

- Empirical classification groups climates using observed data, mainly temperature and precipitation. It does not ask why a climate behaves that way, only what the numbers show.
- Genetic classification groups climates by their causes instead, such as the air masses or wind belts that produce them.
- Applied classification is built for one specific purpose, such as farming or building design.
- V. Koeppen built the most widely used empirical scheme, in 1918. He linked specific temperature and precipitation values to the natural vegetation they support.

Koeppen's Five Climate Groups

- **A – Tropical.** The coldest month still averages 18°C or higher. Capital letters A, C and D are temperature-based humid groups. E is the **polar** group, set by its warmest month, and parts of it are polar deserts.

- **B – Dry.** Potential evaporation exceeds precipitation here. B is the one group marking dry climates, not humid ones.
- **C – Warm Temperate.** The coldest month averages between -3°C and 18°C. These are the mid-latitude climates.
- **D – Cold Snow Forest.** The coldest month averages -3°C or below. D climates are most extensive across the large land masses of the Northern Hemisphere. Small areas also occur in the Southern Hemisphere, for example in the southern Andes.
- **E – Cold.** Every month averages below 10°C. E climates sit at the highest latitudes. Much of inland Antarctica gets only centimetres of snow a year, yet it stays in E, because dryness alone puts a place in B only under B's separate test.
- **H – Highland.** This climate is cold simply because of elevation, not latitude. It can appear at any latitude wherever mountains rise high enough.
- Small letters mark seasonality within each group. **f** means no dry season. **m** means a short monsoon-style dry season. **w** means a winter dry season. **s** means a summer dry season.
- Within Group B, **S** marks a steppe or semi-arid climate. **W** marks a true desert climate.

Quick check 1. Q1. True or False: According to Koeppen's scheme, the letter B marks a dry climate rather than a humid one. *(True or False?)* See answer ↓

Think it through, before reading on. India's Great Northern Plains feel hot and tropical for most of the year. Yet their Koeppen code is Cwg, a warm temperate code, not a tropical one. What single fact about the coldest month decides that?

Show the explanation

Koeppen draws the line between A and C using one number: the coldest month's average temperature. A tropical code needs the coldest month at 18°C or above. The Northern Plains' winter, mild by global standards, still dips just below that line, so the whole region falls into the C group despite feeling tropical the rest of the year.

Climate Types Around the World

Good to Know

Tropical, Dry and Warm Temperate Climates

- **Af – Tropical Wet.** Found near the equator, in the Amazon Basin, western equatorial Africa and the East Indies islands. Rain falls almost every month.
- **Am – Tropical Monsoon.** Found in parts of the Indian subcontinent, such as the west coast and the north-east, plus north-eastern South America and northern Australia, tied closely to the same mechanism behind the Indian Monsoon. Rain is heavy in summer, and winter stays dry. Much of India falls under other types, such as Aw (tropical savanna) and the Cw humid subtropical types with a dry winter.
- **Aw – Tropical Wet and Dry.** Found north and south of the Af zone, such as the Amazon forest's fringes, Sudan and southern Central Africa. Rainfall is lower and more variable, with grassland vegetation.

- Dry climates span 15° to 60° latitude on both sides of the equator. Subtropical steppe and desert sit between 15° and 35°. Mid-latitude steppe and desert sit between 35° and 60°, mainly in continental interiors. Steppe (BS) gets just enough rain for sparse grassland, while true desert (BW) gets far less; the highest air temperature officially recorded, 56.7°C, was measured at Furnace Creek (Greenland Ranch), Death Valley, on 10 July 1913, in this subtropical desert zone. The old textbook figure of 58°C at Al Aziziyah, Libya, was invalidated by the WMO in 2012.
- **Cwa.** Humid subtropical with a dry winter, found in the North Indian Plains and interior South China. It resembles Aw, except winters here stay warm instead of hot year-round. Its vegetation shifts accordingly, away from true tropical forest.
- **Cs – Mediterranean.** Found around the Mediterranean Sea and on west coasts near 30-40° latitude, such as Central California and Central Chile. Summers are dry under a subtropical high. **Csa** has a hot summer, with the warmest month above 22°C. **Csb** has a cooler summer, with no month above 22°C. Winters are mild and rainy under the westerlies.
- **Cfa – Humid Subtropical.** Found on the eastern side of continents, like the southeastern United States and southern China, with rain all year round and hot summers near 27°C. **Cfb – Marine West Coast.** Sitting poleward of the Mediterranean zone on western coasts, moderated by the nearby ocean into small daily and yearly temperature swings.

> **Quick check 2.** Q2. True or False: The Am climate type is found in parts of the Indian subcontinent, with heavy rain in summer and a dry winter. *(True or False?)* See answer ↓

Quick check 3. Q3. True or False: In Koeppen's system, the small letter f marks a climate with no dry season at all. *(True or False?)*

See answer ↓

Cold and Polar Climates

- **Df and Dw.** Cold snow-forest climates occur between 40° and 70° north latitude, across Europe, Asia and North America. Df has a humid winter. Dw, found mainly in north-eastern Asia, has a dry winter with a monsoon-like wind reversal.
- **ET – Tundra.** Common in polar regions, and also found on cold high mountains. Its warmest month averages at least 0°C but below 10°C. It is named for its low mosses, lichens and flowering plants. The subsoil stays permanently frozen as permafrost.
- **EF – Ice Cap.** Found over interior Greenland and Antarctica. Temperatures stay below freezing even in summer, and accumulated ice eventually breaks off as icebergs.
- **H – Highland.** Governed by elevation rather than latitude. Temperature and rainfall both change sharply over short distances, creating layered climate zones up a mountainside.

Quick check 4. Q4. True or False: The Mediterranean climate, Cs, has a dry summer and a mild rainy winter. *(True or False?)* See answer ↓

Quick check 5. Q5. True or False: Koeppen Group E is defined mainly by elevation rather than by latitude. *(True or False?)* See answer ↓

Beyond Classification: The Greenhouse Effect

- Gases in the atmosphere trap some outgoing heat and re-radiate it back down. Without this natural greenhouse effect, Earth's surface would be about 33°C colder than it actually is.
- Carbon dioxide, methane, nitrous oxide and CFCs are the main greenhouse gases. Burning fossil fuels adds far more of them than natural sources alone, an "enhanced" version of the same effect that drives modern global warming.
- Koeppen's climate types are not fixed forever. As global temperatures shift, the boundaries between his climate groups can shift too.

Remember the pattern. Exam questions almost always swap one letter in a Koeppen code, or swap which season is wet versus dry. Learn each code's exact criteria, not just its general feel.

Quick Q&A

Which capital letter marks a dry climate?

B, the only group defined by moisture balance rather than temperature.

Which Koeppen type is India's tropical monsoon climate?

Am, found in parts of the subcontinent such as the west coast and the north-east. Other parts are Aw or Cw types.

What does the small letter f mean?

No dry season at all, rain spread through the year.

What marks the Mediterranean climate, Cs?

A dry summer under the subtropical high, hot in Csa and cooler in Csb, and a mild, rainy winter under the westerlies.

📝 Exam Point of View

🔗 Related Topics

- Climatology: Atmosphere, Weather and Climate
- Natural Vegetation and Major Biomes of the World
- The Indian Monsoon: Mechanism and Drivers
- Natural Vegetation and Biomes of India

✅ MCQ on Koeppen’s Scheme of World Climate Classification

🎲 More World Geography Practice

Practice MCQs

1. According to Koeppens scheme, which capital letter marks a dry climate rather than a humid one?

A. B

B. A

C. C

D. D

See answer ↓

2. Which Koeppen climate type is found across the Indian subcontinent, with heavy rain in summer and a dry winter?

A. Cfa

B. Am

C. Af

D. Aw

See answer ↓

3. Which small letter in Koeppens system marks a climate with no dry season at all?

A. f

B. m

C. w

D. s

See answer ↓

4. The Mediterranean climate (Cs) is best described by which pair of seasonal conditions?

A. Cold dry summer, warm rainy winter

B. Uniform rainfall in every season

C. Hot dry summer, mild rainy winter

D. Warm rainy summer, cold dry winter

See answer ↓

5. Which Koeppen climate group is defined mainly by elevation rather than by latitude?

A. Group H

B. Group D

C. Group E

D. Group C

See answer ↓

Answer Key

1. **A.** Group B is the only group defined by moisture balance, not temperature. Here potential evaporation exceeds precipitation. ↑ Q1
2. **B.** Am is the tropical monsoon type. Rainfall is concentrated in summer, and winter stays dry. ↑ Q2
3. **A.** The letter f marks a climate with no dry season. m marks a short monsoon-type dry season, w marks a winter dry season, and s marks a summer dry season. ↑ Q3
4. **C.** Cs regions sit under a subtropical high in summer, giving hot, dry conditions, then shift under westerly winds in winter, giving mild and rainy conditions. ↑ Q4
5. **A.** Group H, Highland climate, turns cold because of height above sea level. It can occur at almost any latitude wherever mountains rise high enough. ↑ Q5

Quick-check answers

1. **True.** ↑ 1
2. **True.** ↑ 2
3. **True.** ↑ 3
4. **True.** ↑ 4
5. **False.** ↑ 5

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