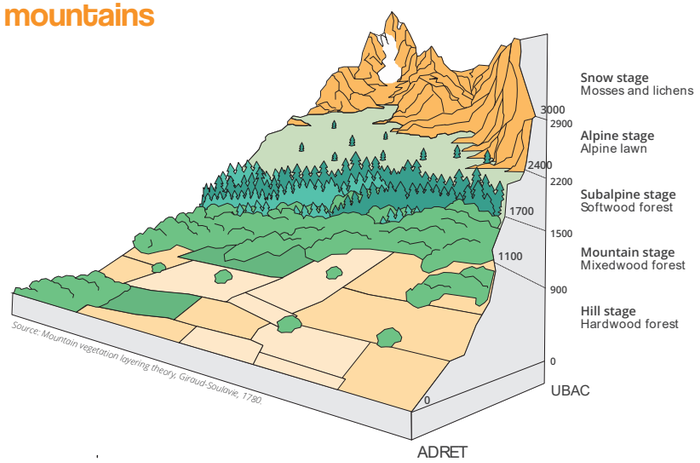
Climate and ecosystems

Mountains are home to unique ecosystems, shaped by the complex relationship between climate and topography. Varying altitudes create microclimates that influence the distribution of plant and animal life. From high-altitude forests to alpine meadows, each mountain ecosystem has its own distinctive characteristics. These regions also play a crucial role as freshwater reservoirs for downstream valleys. The study of these interactions offers an insight into the complex dynamics that define these environments, highlighting the richness and variety of mountain life.

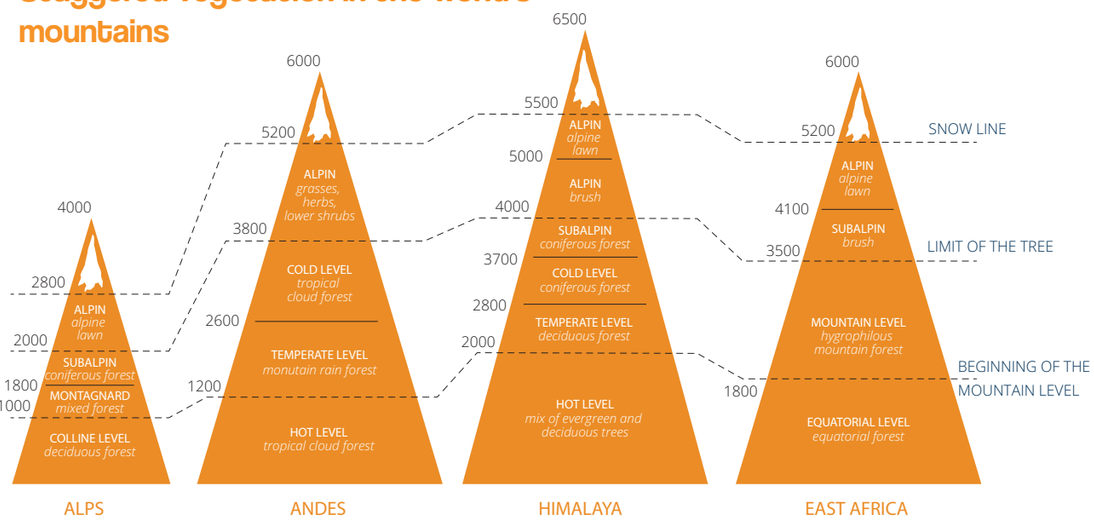
Vegetation and elevation

The layering of mountain vegetation is a remarkable demonstration of plant adaptation to changes in altitude. At lower altitudes, dense forests thrive with species adapted to moderate temperatures. At mid-altitude, conifers dominate. Alpine meadows emerge higher up, home to plants resilient to extreme conditions. At the highest altitudes, only lichens and mosses survive in an inhospitable environment. This vertical zoning reflects the ingenious ability of plants to adjust, creating a diverse mountain ecosystem.

Staggered vegetation in the French mountains

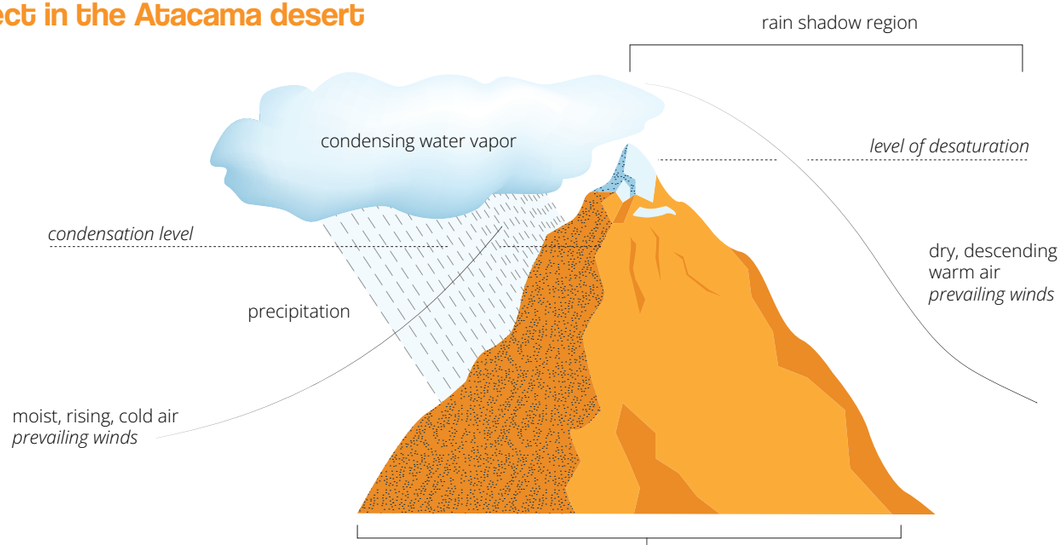


Staggered vegetation in the world's mountains



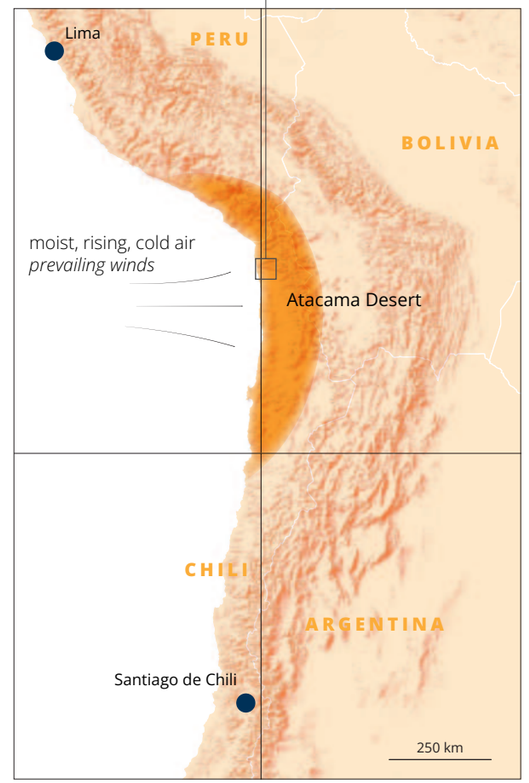
Sources: Hypergéo, 2023. Géoconfluences, 2023.

Foehn effect in the Atacama desert



The world's driest desert

The foehn effect, a meteorological phenomenon, results from the descent of dry, warm air from one mountain to the other. The air cools as it rises, releasing moisture and causing rain in the west. As it descends, it heats up through adiabatic compression, drying out the air.
In the Atacama Desert, between the Pacific Ocean and the coastal mountains, the foehn effect is essential. Moist winds from the ocean meet the mountains and bring rain to the west. As they descend to the east, the foehn effect warms the air, evaporating the precipitation before it reaches the desert. The Atacama, one of the world's most arid deserts, owes its climate largely to this meteorological phenomenon.



Sources: Natural Earth, 2023. Météo-France, 2023.