

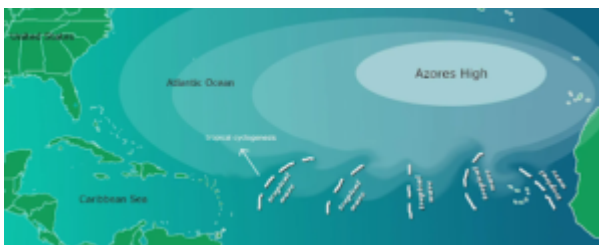
Azores High

July 13, 2022

In news— According to a new study, an extremely large 'Azores High' has resulted in abnormally dry conditions across the western Mediterranean, including the Iberian Peninsula, primarily occupied by Spain and Portugal.

What is Azores High?

- It large persistent **atmospheric high-pressure centre that develops over the subtropical region** of the eastern North Atlantic Ocean **and western Europe** during the winter and spring seasons in the Northern Hemisphere
- It is **associated with anticyclonic winds in the subtropical North Atlantic.**
- It is **formed by dry air aloft descending the subtropics** and coincides with the downward branch of the **Hadley Circulation.**



- Azores high is **also called Bermuda high, Azores anticyclone, or Bermuda-Azores high.**
- It is a subtropical high-pressure cell that moves westward during the summer and fall, when it is known as the Bermuda high.
- The Bermuda high is often associated with warm humid weather in the eastern United States during the summer months.
- **It forms one pole of the North Atlantic oscillation, the other being the Icelandic Low.**
- The system influences the weather and climatic patterns of vast areas of North Africa and Southern Europe, and

to a lesser extent, eastern North America.

- The aridity of the Sahara Desert and the summer drought of the Mediterranean Basin is due to the large-scale subsidence and sinking motion of air in the system.

What does the study say?

- According to the record, an annual drying of 5-10 millimetres per year per decade has been recorded in the Iberian Peninsula throughout the second half of the 20th century.
- A further **10-20 per cent drop in winter precipitation is expected** by the end of the 21st century
- These projected changes make agriculture of the Iberian region some of the most vulnerable in Europe.
- The study projected:
 - **Olive-growing regions in southern Spain will suffer a 30 per cent decline in production** by 2100
 - **Cultivation area in grape-growing regions** across the Iberian Peninsula **will shrink 25-99 per cent by 2050** due to severe water deficits that will render land unsuitable for viticulture.
- The researchers showed that the **Azores High expansion is driven by external climate forces** and that the only external forcing that produces this signal in the industrial era is atmospheric greenhouse gas concentrations.
- The researchers explored the changing atmospheric conditions since the onset of the industrial era that contributed to these regional hydroclimatic changes by assessing how the characteristics of the Azores High varied over the past 1,200 years.
- Observations and climate model simulations were used to show that **winters with an extremely large Azores High were significantly more common in the industrial era (since 1850)** than in pre-industrial times.
- Simulations of the past millennium indicated that the

industrial-era expansion of the Azores High is unprecedented throughout the past millennium (since 850) “consistent with precipitation proxy evidence from Portugal”.

- **The study identified a robust increase in the frequency of extremely large Azores High Area (AHA) events and an overall expansion signal in the winter Azores High over the past 100 years.**
- Azores High expansion **emerged after 1850 and strengthened in the twentieth century**, consistent with anthropogenically driven warming, according to the report.
- The study showed that the **Azores High has changed dramatically in the past century** and that **these changes in North Atlantic climate are unprecedented within the past millennium.**
- An expanding Azores High agrees with reports of a **poleward shift in the North Atlantic storm track** and an **increase in anticyclone frequency at the Azores High’s poleward edge** as well as a positive trend in regional subtropical indicators.
- The **findings have important implications for projected changes in the western Mediterranean hydroclimate** throughout the twenty-first century.
- The study is important to understand the future climate risks posed to productive agricultural sectors such as viticulture and olive plantations across the Iberian Peninsula.