



Dust and Sandstorms Events in January 2024

Executive Summary:

This report presents an in-depth analysis of dust and sandstorm (SDS) events across Saudi Arabia during January 2024, benchmarked against the 21-year climatological average (2003–2023). A total of 19 dust hours distributed over 8 days were recorded, reflecting a 91% decrease in dust hours and an 84% decrease in dust days compared to the long-term mean. Regional variations were pronounced: the Eastern Province (notably Al-Ahsa and Dhahran) exhibited the steepest declines, with anomalies up to -37 hours and -5 days at Al-Ahsa, while Dammam fell to zero (-2 h; -1 d). The Central sector (Riyadh & Al-Qassim) showed widespread suppression: Riyadh, Al-Kharj, and Al-Dawadmi dropped to zero (down to -12 h; -3 d locally), Al-Qassim registered only 1 day/2 h (-15 h; -3 d), whereas Wadi Al-Dawasir was the only positive anomaly nationwide ($+2$ hours; $+1$ day). Across the Northern tier, Al-Qurayyat, Turaif, and Rafha recorded isolated short events (1 day each; deficits -16 to -4 hours and -2 days), while Al-Jawf and Arar had none. In the Western and Southern regions, most stations Jeddah, Taif, Al-Madinah, Yanbu, Najran, Jizan, Al-Baha, Bisha—recorded no activity despite historical means; the exception was Khamis Mushait (1 day/3 h; -11 h; -2 d). On the event scale, blowing dust dominated the observations at the few active stations, with no significant dust-storm (DS/SS) cases recorded. These results emphasize the exceptional suppression of SDS activity across the Kingdom in January 2024, with deficits exceeding 80% for both dust days and hours. Spatial contrasts were limited to a handful of briefs, isolated events, underscoring the influence of synoptic-scale conditions that did not favor dust generation or persistence during the month.