

How it HAPPENED

Rapid desertification, unprecedented heat wave conditions, greater number of Western Disturbances, increasing cyclonic circulations and two lines of low pressure winds combined to trigger the massive storms across India

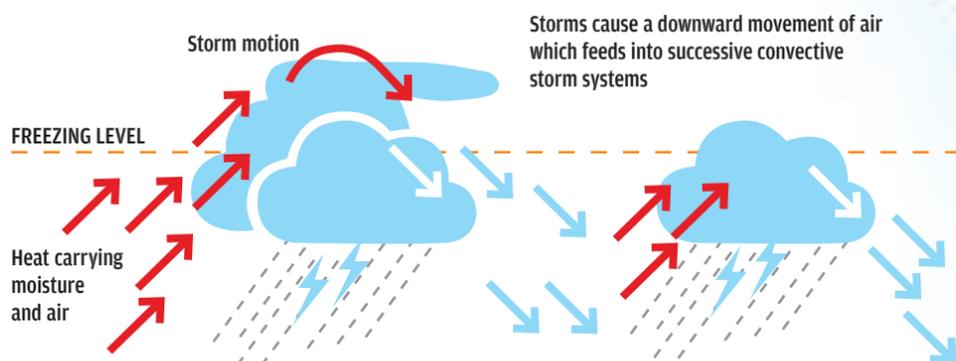
Legends

- Area under desertification
- Storms (Hail, thunder, dust)
- Wind direction

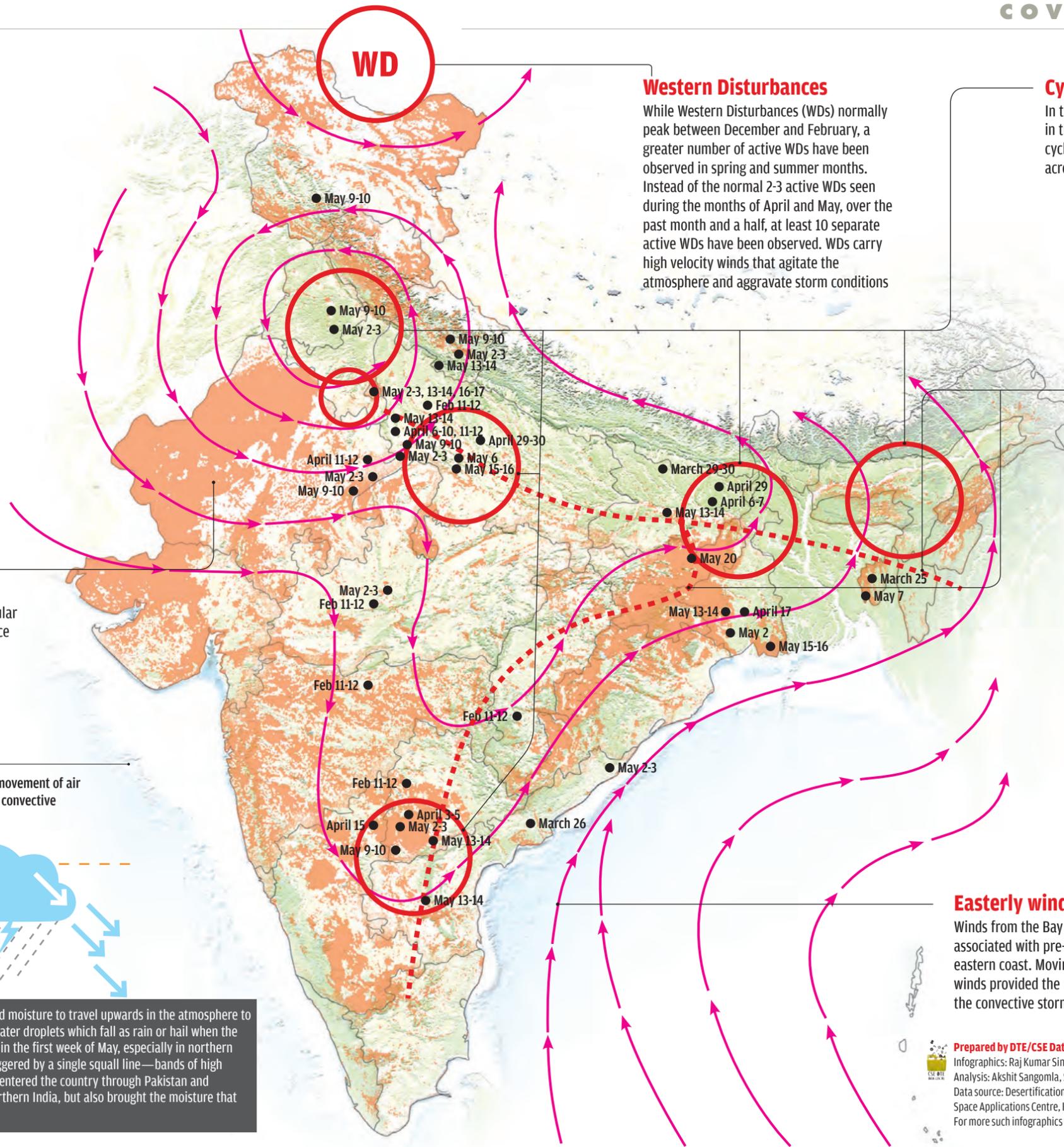
Unusually hot conditions

Temperatures over 40°C observed in northwest, central, east and north peninsular India. Interaction of hot air near the surface with colder winds from the Western Disturbances gives rise to intense and widespread storms

HOW CHAIN OF STORMS ARE FORMED



Convective storm systems develop when intense heat at or near the surface causes air and moisture to travel upwards in the atmosphere to form storm-bearing clouds. As a cloud gains height, water vapour condenses and forms water droplets which fall as rain or hail when the cloud is no longer able to hold the moisture. The peculiar characteristic about the storms in the first week of May, especially in northern and northwestern India, was a kind of chain reaction of storms, which was apparently triggered by a single squall line—bands of high speed winds high up in the atmosphere that typically bring storms and rain. These winds entered the country through Pakistan and Afghanistan. The squall line not only invigorated the systems of cyclonic circulations in northern India, but also brought the moisture that perpetuated successive convective storms



Western Disturbances

While Western Disturbances (WDs) normally peak between December and February, a greater number of active WDs have been observed in spring and summer months. Instead of the normal 2-3 active WDs seen during the months of April and May, over the past month and a half, at least 10 separate active WDs have been observed. WDs carry high velocity winds that agitate the atmosphere and aggravate storm conditions

Cyclonic circulations

In the build up of the massive storms in the beginning of May, five separate cyclonic circulations were observed across the country

Trough

A trough is an extended area of low pressure developed along the E-W axis. This where moisture-laden winds from the Bay of Bengal met hot and dry air from central and western India. These winds also came in contact with the cold front that develops due to active WDs. The confluence of these different winds culminated in intense and widespread storms across the Indo-Gangetic plain. Similarly a N-S trough was formed from Bihar to northern Tamil Nadu, along which stormy weather was observed in Telangana, Andhra Pradesh and some parts of Karnataka

Easterly winds

Winds from the Bay of Bengal carry moisture and are associated with pre-monsoon thunder storms in the eastern coast. Moving towards the troughs, these winds provided the moisture that further intensified the convective storms

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 Data source: Desertification and Land Degradation, Atlas of India 2016 by Space Applications Centre, ISRO, NDMA and UP State DMA and media reports
 For more such infographics visit: www.downtoearth.org.in/infographics