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The impact of artificial forest on the regional surface wind speed

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The three-north (north-west, east-west, north-China) artificial forecast is the biggest artificial forecast in China, aiming to prevent and decrease the strength of sand storm originating from desert area in northwest China. North-China is experiencing the most severe air pollution in China history, especially the high concentration of PM2.5. It is known that the dry deposit of PM2.5 mostly relying on the horizontal diffusion effect due to the horizontal wind. For Beijing, the north wind is critical to the dry deposit of PM2.5. Weather Research and Forecast (WRF) model is conducted to explore what kind of effect of artificial forecast has on the dry deposit of PM2.5. Our research shows that, although the artificial forecast plays a important role in preventing the happening of sand storm, however, it slow down the horizontal wind speed by 9% which has significant negative effect on dry deposit of PM2.5. Further analysis reveals that the decreasing of 9% on north wind speed can cause about the increasing of 9% of PM2.5.