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Aeolian dust as a an indicator of changing regional patterns of wind erosion on the Southern High Plains of North America

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Detecting and quantifying changing regional patterns of wind erosion activity is complicated by a lack of long-term records of direct wind erosion measurements. Here, we attempt to piece together indirect evidence of changing wind erosion activity on the Southern High Plains. Sources of indirect evidence include visibility-based observations of blowing dust as well as past measurements of ambient particulate matter concentration. Both the visibility record and particulate matter record suggest independently that there have been significant declines in blowing dust during the last forty years. There are three key factors that may have contributed to the observed reduction of blowing dust - natural climatic variations, changing land use, and improved agricultural practices. Historical climatic records suggest that there have been no appreciable climate shifts that could account for the observed decline in blowing dust. Although it is not possible to rule out land use as a factor in the reduction of blowing dust, one can point to periods when land use changed very little while annual dust levels decreased significantly. Overall, the relatively minor changes in land use, including the removal of land from production, cannot fully account for the magnitude of the observed reduction of ambient dust levels on the Southern High Plains. We are left to conclude that the adoption of improved agricultural practices has played a crucial role in reducing wind erosion activity and dust emissions on the Southern High Plains.