

Publication

South Africa's agricultural dust sources and events from MSG SEVIRI

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 4614247**Author(s)** Eckardt, F. D.; Bekiswa, S.; von Hold, J. R.; Jack, C.; Kuhn, N. J.; Mogane, F.; Murray, J. E.; Ndara, N.; Palmer, A. R.**Author(s) at UniBasel** [Kuhn, Nikolaus J.](#) ;**Year** 2020**Title** South Africa's agricultural dust sources and events from MSG SEVIRI**Journal** Aeolian Research**Volume** 47**Pages / Article-Number** 100637**Keywords** Remote sensing, Dust, Land Cover, Agriculture, Drought

Geomorphological dust research in Southern African has focused on natural sources in Namibia and Botswana. Here we aim to identify South Africa's dust sources using the Spinning Enhanced Visible and Infra-red Imager data (SEVIRI) between 2006 to 2016. A total of 334,497 images identified 178 dust plumes on 75 dust days, which originate mostly from the Free State, between June to January. Source areas consist of commercial agriculture, grass and shrublands. Half of all event days in the record occurred between 2015 and 2016, a severe drought, according to the Standardised Precipitation Evapotranspiration Index. Crop statistics report a decline in maize cover from 1.2 to 0.6 million hectares and a pronounced increase in fallow cover, confirmed by a below average Normalized Difference Vegetation Index. Transport-capacity appears to be enhanced during drought years and on the increase in wind records. All dust event days adhere to a diurnal wind pattern, irrespective of synoptic conditions and most trajectories head towards the Indian Ocean. In terms of both frequency and extend, SEVIRI events are minor when compared to the northern hemisphere. However South Africa's major dust sources differ in that they appear to be mostly associated with anthropogenic activities especially rainfed agriculture. The emission potential from natural surfaces remains to be examined. Fire however is not a common precursor in dusty years. The widespread Luvisols and Arenosols, are rich in silt and sand, extend into the wider interior, including the Kalahari, where future climate scenarios by others have predicted increases in dust emissions.

Publisher Elsevier**ISSN/ISBN** 1875-9637**edoc-URL** <https://edoc.unibas.ch/81298/>**Full Text on edoc** No;**Digital Object Identifier DOI** 10.1016/j.aeolia.2020.100637**ISI-Number** 000582628400005**Document type (ISI)** Article