

# GIMMS NDVI time series reveal the extent, duration, and intensity of 'blooming desert' events in the hyper-arid Atacama Desert, Northern Chile

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The 'blooming desert', or the explosive development and flowering of ephemeral herbaceous and some woody desert species during years with abnormally high accumulated rainfall, is a spectacular biological phenomenon of the hyper-arid Atacama Desert (northern Chile) attracting botanists, ecologists, geo-scientists, and the general public from all over the world. However, the number of 'blooming deserts', their geographical distribution and spatio-temporal patterns have not been quantitatively assessed to date. Here, we used NDVI data from the Global Inventory Modeling and Mapping Studies (GIMMS) project to reconstruct the annual land surface phenology (LSP) of the Atacama Desert using a non-parametric statistical approach. From the reconstructed LSP, we detected the 'blooming deserts' as positive NDVI anomalies and assessed three dimensions of the events: their temporal extent, intensity of 'greening' and spatial extent. We identified 13 'blooming deserts' between 19