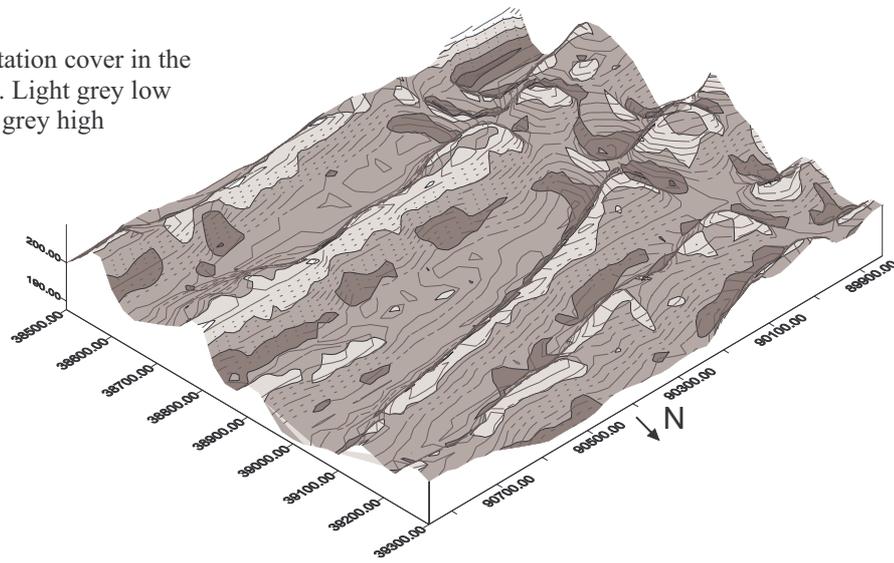


## A stochastic model for biomass distribution in arid sand dunes

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A simple numerical approach to model the actual standing biomass distribution of a small area within the southern part of the sand dune field of the northwestern Negev (Israel) near Nizzana [1] were developed and probable boundary conditions that may be responsible for the vegetation patterns investigated in detail. Our results for several climatic, geomorphological, hydrological and biological parameter characteristics at the four measurement stations along a transect from northwest to southeast allowed for the development of a stochastic model for biomass distribution over the entire sand dune field (mesoscale) and at Nizzana experimental station (microscale). With this equation it was possible to compute and interpolate a biomass index value for each gridpoint on the mesoscale and microscale grid (Fig. 1).

**Fig. 1:** Modelled vegetation cover in the sand dunes of Nizzana. Light grey low vegetation cover, dark grey high vegetation cover



The spatial distribution as biomass is negatively linked to the distance from the sea and relief energy; both indicating higher overall biomass in the northern, flatter part of the sand dune field. Biomass is also negatively linked to rainfall, and this is a most interesting finding pointing to patches of higher standing biomass in favorable habitats all over – and especially in the higher sand dunes of the southern, drier part – of the sand dune field. In fact, confirmatory assessments of biomass in 20 locations revealed a very good interrelation with the values modelled for the respective sites.

### Reference

- [1] Veste M, Eggert K, Breckle SW, Littmann T (2005) Vegetation entlang eines geo-ökologischen Gradienten in der Negev. In: Veste M, Wissel C (Hrsg.) Beiträge zur Vegetationsökologie der Trockengebiete und Desertifikation. UFZ Bericht 1/2005, Leipzig: 65-81.