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Atlas of Dutch drift sands

Michel Riksen and Pieter Jungerius

Wageningen University, Wageningen UR, Soil physics and Land Management group, Wageningen, Netherlands (michel.riksen@wur.nl)

The Netherlands is well known for its aeolian landscapes. Frequent storms during the High Middle Ages (1000-1300 AD) reactivated Pleistocene coversands and river dunes and are responsible for the formation of the Holocene drift sands at a scale which is unique for Europe. A hypothesized relationship with farmer practices for making plaggensoils has recently been refuted, because drift sand formation began centuries earlier. The coastal dune belt with their parabolic dunes dates from the same period as the drift sand. An estimate of the extent of drift sands can be made from soil maps: drift sands are too young to show much profile development (Regosols). With this method Koster estimated the maximum extent of Holocene drift sands in the Netherlands to be about 800 km2 (Koster 2005). Laser altimetry allows a more precise estimate of the total surface affected by wind from the characteristic relief patterns produced by the Holocene wind, which is different from the smooth surface of cover sand deposits. Laser altimetry has been used before to investigate the mechanism of drift sand formation (Jungerius & Riksen 2010). Most of the surface affected by wind is not active anymore, but the tell-tale rough surface survived ages of different landuse. The total affected surface amounts to 825 km2. It is noteworthy that both methods give comparable results.

We recorded a total number of 367 of affected areas of varying shapes, ranging in size from 1.6 ha to a large complex of drif sands of 7,119.5 ha. As is to be expected from their mode of origin, most occurrences are associated with cover sands, and with river dunes along the river Meuse and smaller rivers in other parts of the country. Particularly the final phases of cover sand and river dunes that show more relief as parabolic dunes were affected. There are also small aeolian deposits at the lee side blown from fallow agricultural fields but they are (sub)recent.

Most of the relief is irregular, but the larger occurrences associated with push moraines show that drift sand occurs in elongated cells that are parallel to the prevailing SW wind. Their internal structure reflects the characteristic sequence of geomorphological processes: deflation dominant in the south-west, transport and accumulation towards the north east.

Literature

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