



The Implementation of the Geostatistical Kriging Interpolation Method for Soil Salinity Monitoring in Arid Conditions. Case Study: Fayoum Governorate, Egypt

Ahmed Hafiz and Ahmed Hamdi Mansi

Fayoum University, Faculty of Agriculture, Soils and Water, Egypt (ahmedd.hafiz@gmail.com)

Soil salinity is one of the essential factors limiting crop production in arid and semi-arid regions. Hence, mapping and monitoring such a factor is crucial for land and water resources management and consequently the improvement of agricultural production. The changes of soil salinity levels of the study area, i.e. Fayoum, Egypt, have been assessed and monitored processing the recently made-available field data of electrical conductivity measurements collected in 2014 and those of 2009, where the geostatistical Kriging method is exploited to generate the salinity maps. The results show significant improvements in soil salinity levels, as the area of none saline soils ($< 2 \text{ dS m}^{-1}$) increased from 1.3 ha in 2009 to 9119 ha in 2014. Such results could be directly associated to the construction of a new sub-surface drainage system, whose installation started in 2007, thus demonstrating the effectiveness of the water management policies applied in the study area. Moreover, the soil salinity values show an inverse correlation with the altitude, which could explain the increasing salinity levels around the Lake Qarun due to the shallow saline ground water table and the low efficiency of the drainage system.