

Abstract

The study aims to reveal the impact of climate change on soil properties, and to find out the percentage of this change in Wasit governorate, as soil is a major component of the Earth's ecosystem, and the most affected by climatic conditions, but it determines the type of impact of the combined element of physical, chemical, biological and human processes that act on the soil parent material.

Based on modern technologies in the scientific methods represented by artificial intelligence methods, in particular remote sensing (RS), Geographic Information Systems (GIS), digital elevation model (DEM), satellite visuals (Land Sat 5.7.8), through the processing of space visuals and converting them into the form of outputs with digital maps, and through programs it is possible to determine the size of the change that has occurred on the soil and its spatial distribution, knowledge efficiency and accuracy in matching their results with the conservative spatial reality.

The study relies on seven indicators to detect the climatic changes affecting the soil characteristics of Wasit governorate, namely:

- * Soil erosion index (BSI).
- * Soil biological crust index (CI).
- * Moisture stress index (MSI).
- * Vegetation cover index (NDVI).
- * Water cap indicator (NDWI).
- * Soil salinity index (SI).

Wasit governorate is represented by its astronomical location located two circles of latitude (31 -4533 -30 -) North and longitude (44 -31) -46 -34) East, bordered to the north by Baghdad and Diyala governorates, to the South by Dhi Qar governorate, to the East by Maysan governorate, to the West by Babylon and Diwaniyah governorates, and to the East by the Islamic Republic of Iran, which is thus located within the central region of Iraq, with an area of (17235) km².

The change was analyzed for the general trend of the climate elements and the values of the annual change for the study period (44) years, spanning from the years (1979-2022), and for eight air monitoring