

# ***ABSTRACT***

Maps are so important to serve our live, maps are used at ancient centuries by different cultures. Nowadays we have two types of maps the planimetric and topographic maps. There are several mathematical models to represent the shape of the earth. The verity in map datum and map projection may cause some confusion and errors.

One of published maps in Sudan are 1:100,000 which datum Clarke 1880 and projection TM. Nowadays many users using WGS84-UTM by default.

The objective of this research is to compare the effect of changing map datum or projection on measured map distances and evaluate these effects.

Datum change has greater effect than the projection change. The error in measured distance is depends on the direction and the scale factor between WGS84 and CLARKE1880 is 0.996.