

Lineament Extraction from SPOT 5 and NigeriaSat-X Imagery of the Upper Benue Trough, Nigeria.

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The Upper Benue Trough is part of the Benue Trough of Nigeria and is comprised of three basins: the east–west trending Yola Basin (Yola Arm), the north– south trending Gongola Basin (Gongola Arm) and the northeast– southwest trending Lau Basin (Main Arm). This research is an ongoing research at understanding the structural framework of the Upper Benue Trough using several techniques including the use of Remote Sensing and GIS.

Several digital image enhancement techniques such as general contrast stretching and edge enhancement were applied to the NigeriaSat-X and SPOT 5 image in ERDAS IMAGINE 9.2 after which structures were mapped out on-screen using ArcMap 10. The Digital Elevation Model (DEM) of the Trough was also used to enhance geomorphic features.

The analysis carried out on the images revealed that lineaments are abundant in the Upper Benue Trough and they can be subdivided into four major trends, NE-SW, NW-SE, W-E and N-S in order of abundance and range in length from about 300m to 26km. Several faults were also mapped out within the Basin such as a sinistral fault around Bakoreji village in Bauchi, a dextral fault close to Kalmi town in Gombe and a dextral fault close to Wong in Taraba. It was observed that some of the sites where minerals such as lead and zinc ores are being mined occur in the zones of high lineament density. This study shows the capability of the SPOT 5 and NigeriaSat-X images for lineament/structural interpretations.

Keywords: SPOT 5, NigeriaSat-X, Remote Sensing, GIS, Lineaments, faults