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Analysis of the Longitudinal Profiles of the Doluge Valley in Nineve Governorate using GPS

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Abstract:
GPS technique gives an accuracy information about the longitudinal, of any river or valley. an experiment of the longitudinal form of the Doluge Valley which is a branch of the Khazer River(from its source to the estuary)in Nineveh Governorate was carrid out. Height points and calculate the distance from the flow to the occur in Excel program, which revealed four kink point (692-574-462-308m).They reflect the valley level at points 692,574,462m and the diference in its base level which is on rejuvenation point 308m. Also, this research showed the valley adaptation for the geological structure effect during curving (beding).

Introdution:
GPS technique which can be connected to satellites can be carried by hand , facilitates the ability of gathering information about the earth surface appropriately, and accurately.The measurement is represented by the coordinates (X,Y,Z), and it also restricts the selected position quickly and a high exactness in contact, and with few reception rates that are between 0.5m-100m.
in this study, GPS equipment composed of 24 satallites(vertical height at 24 hours orbit). There is an agreement between the sending and receiving signals and between both the satallite, and the ground receiver GPS on heigh 100m at rate %95 of the time (1).
In the analysis of Longitude of the Doluge Valley which is one of Khazar's branches, where it flows from Gali Qeer montain within a wavy area representing in the southern wing of Anticline Gali Qeer, the Anticline Ainsefni and the plain area (where the Moskan and Dolshfan Valleys meet with the valley).in Nineveh Governorate (figure 1), It is located between the anticline Ainsefni nothward and the anticline Maqlub sowthward. It pours into the Khazar River near Mindan Anticline. In Area (25.14km2), with average area annual rain between 300-600mm(FAO) years 1985-2005.
The Aim of Study is to find the number of kink points in the valley, in addition its the depth , shape, and the change range at the local base level of stream near estuary area. This study is based on GPS equipment the height and the distance between points. in addition rod for measuring the depth a String for measuring the valley's width. landsat 7 space data scale 1/100.000. and Geological map scale 1/250.000.

Structural of Study Area:
The study area occurs within range of low fold zone, where its height is between 500-1500 m (2) four main anticlines enclosing this valley appear in the area; these are Mindan, Maqlub, Ainsefni and Gali Qeer anticlines (figure 1).The southern wing of Gali Qeer represent the valley's sours descends eastwards, but it deviates and is moving towrds south, in Anticline Ainsefni where the nature of construction for this deformation structure represents the fault, existance that cuts this structure into three Anticline Banjat, and the influence of southern diver on the valley direction. It also deviates near Kandala Village(clear from field evidenes and space data interpretation), that the eastern side for each of the Anticline Qand. and the Anticline occuring on its south formed a high area and a roadblock in front of valley direction towards south. The creep of valley of the northen side of the Baashiqa Anticline, and the linear effect attending in this fold. have also affected on the valley movement(3), in addition, western-northern side of the Maqlub Anticline formed a block for the valley. The Fault occurring on the south of this anticline fold and parallel to it(4) has affected the valley morphological in kandala Village. So, Doluge Valley is moving towards the east to pourinto Khazara River.

Statigraphy Of Study Area:
It can restrict the discovered geological formations on this area, from the southern side of the newer although the valley descends from the southern side of the Anticline Gali Qeer, that the Pilaspi formation (figure 2) (5) It also forms here all of the Anticlines Ainsefni, Maqlub and Mindan, while Al Fatha formation is composed of the Lime, gypsum, maril, mud classes sequence, the Injana formation composed of sandstone, mudstone and gharinistone (6)this formatin occupies the limb of the Synicline and Anticlines. whereas the Miqdadia formation is discovered in the anticline of Ainsefni. The northern limb of the Maqlub Anticline is mainly sandstone, sand and mudstone, while the Bai Hassan formation composed of the sandstone and classes of the mudstone (4) and occupies the southern and northern limbs of Ainsefni and Maqlub Anticlines.Quaternary deposition less cover the middle and south parts of the study area.

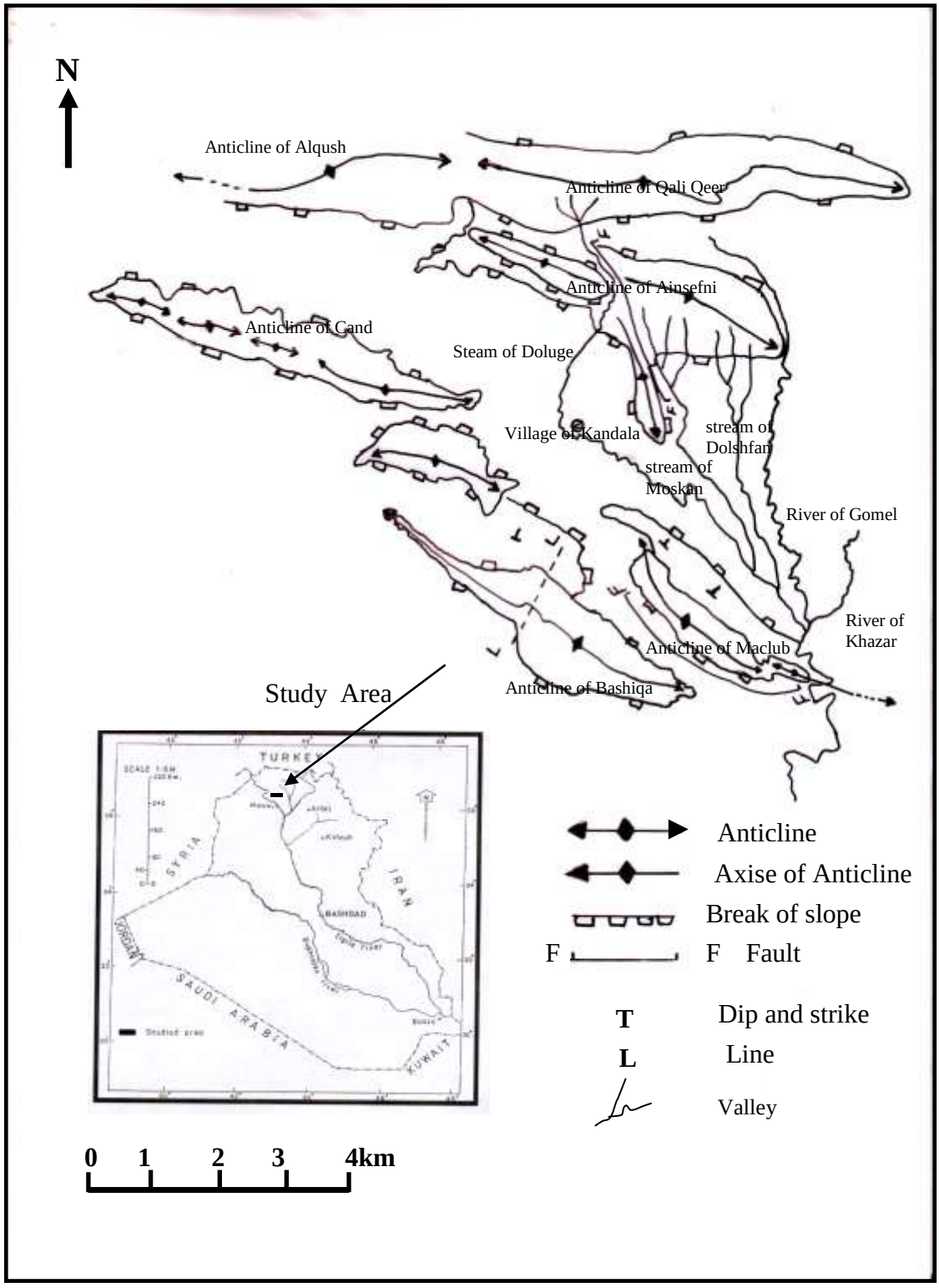


Figure 1: Location of the Study Area

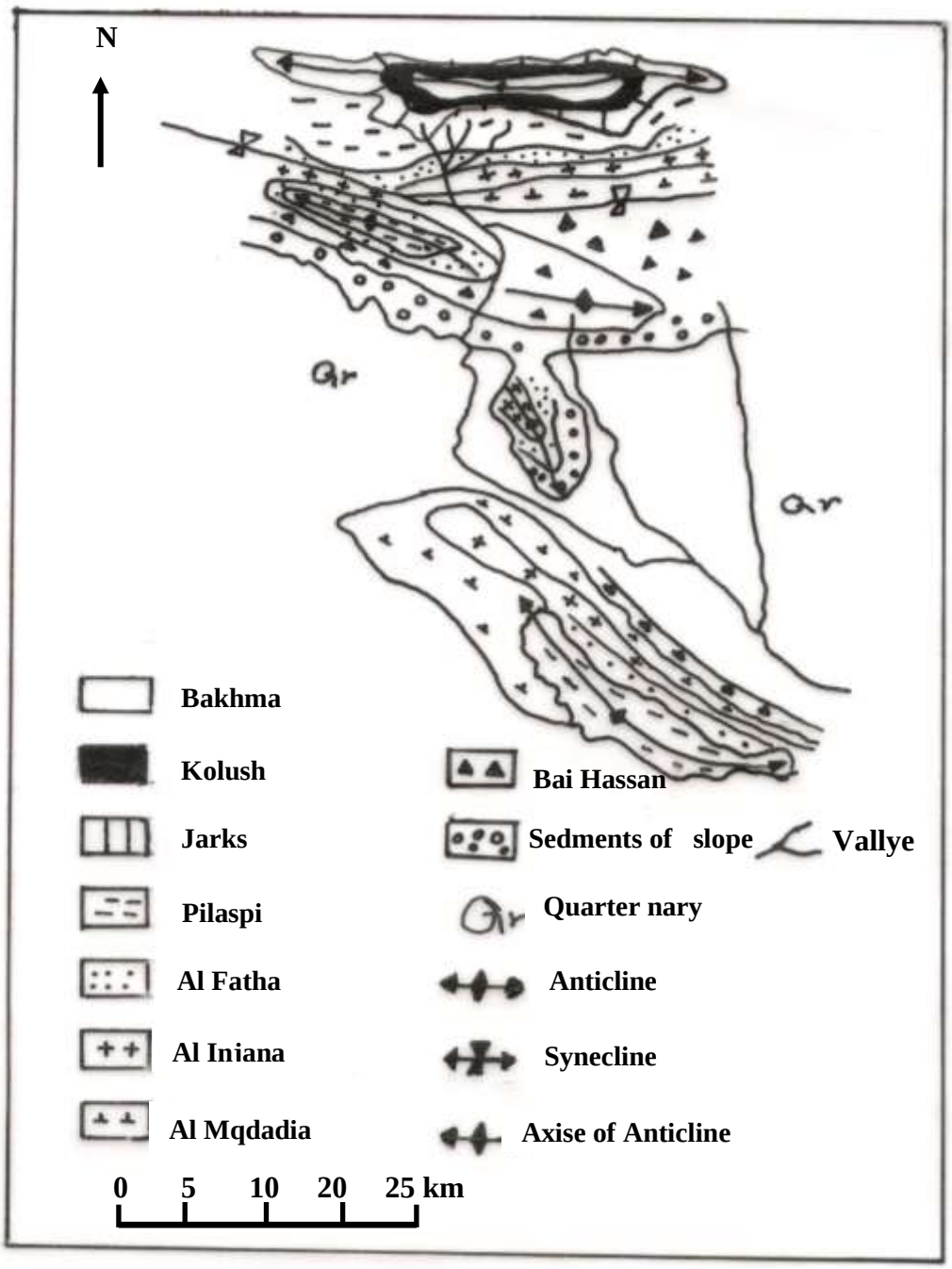


Figure 2: Geological of the Study Area.

Analysis Of The Longitudinal:

The Longitudinal analysis of Doluge Valley, requires detailed field work beginning from the northern spring the valley until to meeting with Khazar River.It took many days on July, 2005 This work consisted of using GPS set in projecting height values and the string and Rod to calculate the valley's depth, and width and to note the happening reaction between the water influences in the valleys, the rocks, and the geological structures leading to the conclution of the present form of the valley (7) and according to (8), suggestion that the water streams have the mechanism effects presenting by the water in the ground form of the stream, which reflect the width average, depth range, slope, speed and fold nature.

The 886m height represents a distribution line of the water for the valley in the southern winy of the Gali Qeer anticline (Figure 3), where the valley shape takes (V) form sharp angle (Table 1) on 828m height point. because the vertical dig naving aclear traces in hard rocks classes returning to Pilspi formation, while it is chaning to(V) angle flate on 734m height point, according to the changes in the trend degree of the rock classes about 10 meters on the fold surface. So it has shared in retricting the lateral dig operation that caused increase in the angle.As aresult,the geomorphology influnce changes from the erosion of the two limbs, to the erosion left and leeser in the right limb. The valley form changes at one point 692m height which represents the first kinik point,

because of the lowering in the classes trend and beginning of making a anticline, where the valley takes folds form, even if the first branch meeting with the valley, leads to the increase in the water amount, lees and emergence of a thick plant cover. The valley at this point is one of the adaptations or the modification in the transport shape for both water and sediment (9). So, the valley is taken in the dig on a limb and the sediment on the other according to the changes in the fold direction on the valley's laterals (Plate 1), and on the height 618m, the valley is working on the deep dig because of the change in both the slope and the lithology, and it represented by meeting the Pila spi formation with the Fatha formation. when the Gali Qeer anticlane is formed, and the difference in the rock nature for the two formationis clear.

The second kink point forms on 574m height point, in the syncline because of the meeting the second branch with the valley, that the leads to the increase of the water pouring amount where of a hydrology power, was formed that it took part in deeping the floor level followed by a change has of the running level. The valley's width expand (3) meters on 559m height point, and the valley morphology her represents a new valley. resulting from the old valley's stream immigation (Plate 2) in addition to the change in the running speed timely, the addition form that the main stream of the valley at 553m height. as a result of the meeting of the third branch with the valley, and increase in the water and the transporting sediments, the valley's width here is not longer (2) meter.

The third kink point represent on 462m height (Figure 3). in the Ainsefni anticline where the stream takes the partition finding in the fault as its pathe(figure 1) where it lead to the change in the general level of the valley within this area. the takes fourth kink point in the plain area on 308m height point. because of the meeting the Moskan Brook and Doshvan Valley (besides the subsidary valleys that descend from the Maqlub anticline and meet with the valley) leading to the valley openning phenomenon in the geological formations, returning to the Quaternary. and the vertical Enhishar phenomenon, is forming as aresult of this meeting and this created the hydrology influences arising from the increase in the water pouring amount and the transporting lees, this led to the valley's width expand with average reached between (28-34) meter until the estuary with the depth difference for four chosen positions from (4m. to 2 m.and 2.5m .to 75c. m.). If the different slope increase in the depth represents in the base level change, which is an idiom that referes to the minimum point where the erosion operations power has reached it in the valley's or river's floor(10).

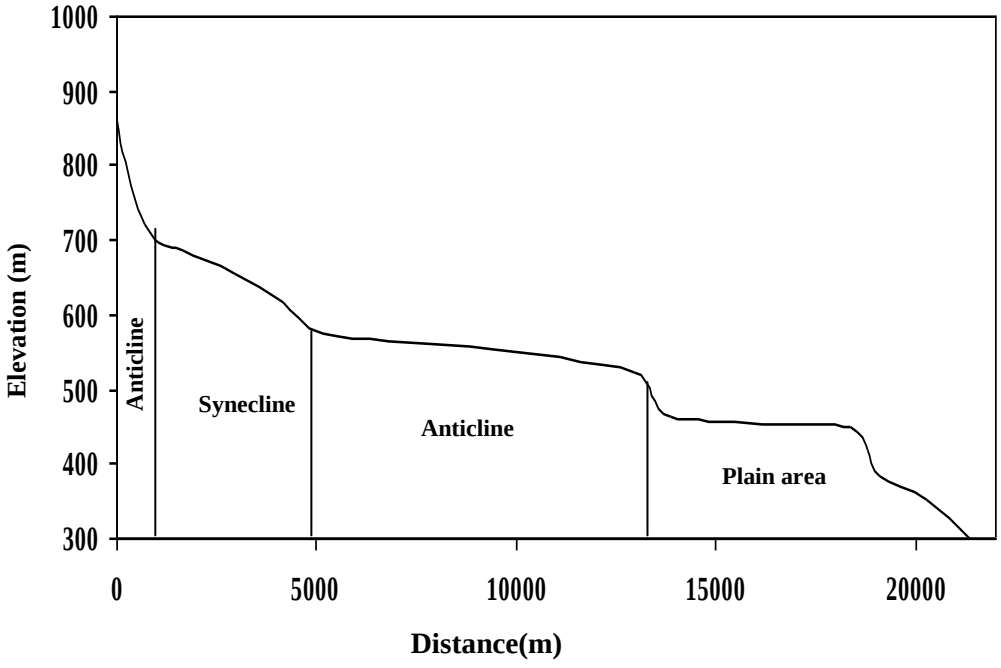
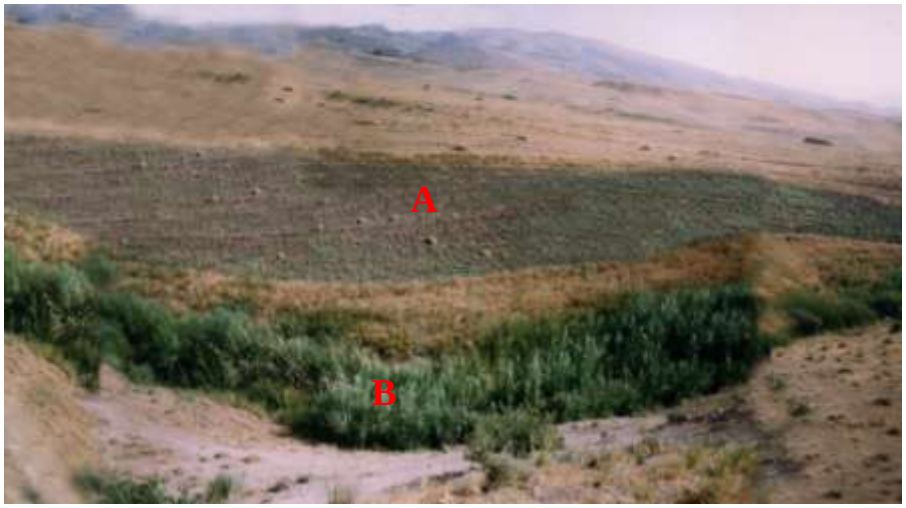


figure (3): Longitudinal Profiles of Doluge Valley

Table(1): The morphology of the valley's longitudinal

The height Valley.m		The distance Valley.m	Valley morphological	The Geoloical feature	Geomorphological of valley flower
1	828	14.8	V	Pilaspi formatiom	The anticlain and occupies the large bonds floor
2	727	191.1	V flat angle	Pilaspi formatiom	The anticlain and the middle size rock crumbs occupy the floor.
3	692	1191.1	The valley's mendar	Pilaspi formatiom	The syniclain and a weak soil and middle sediments to small size.
4	618	2591.1	U flat and deep	Fatha formatiom	The syniclain and soil a invests archiculturely the depth 1.5m and the width 3m.
5	559	6691.1	New valley	Fatha formatiom	Syniclian and archicu- lture invest the depth 1.5 m and the width 3m
6	553	12091.1	Nail shape	Fath, Injana , Migdadia and Bai hassan	Bad lands the shallow streams depth 0.5m and width2m
7	308	19080	Valley opening	Quaternary	Bad lands and stream s dapth and width difference

Plate(1): The Dige A Side and the sediment in B Side



Plate(1): The Dige A Side and the sediment in B Side

Conclusion:

As a resulat of the field study by using GPS equipment to calculate the longitudinaly from south towards east of the Doluge valley, in area about (25.14km2). It is evident this valley is in the low fold zone in north of Iraq, clear from field evidents and space data interpretation are shown in this study that four anticlines Ainsefni,Gand,Baashiqa,and Maclube effect on the valley morphological by the fault, linear, and axise of anticline towardes south to south-east.

Also the elevation points and distance between these points were measured. This study showed the presence of four uplift in the separate the study area, They are at height of (692m,574m,462m and 308m) indicating adjusetment the neotectonic activety, and change the morphological forms in seven forms.

Referenese:

1. Heywood,L.C.and Carver,S.(1999):AN introduction to Geographical information systems,puplished in United States of American ,p.38.
2. AL-Daghistani, H.S. and Salih, M. (1992): "Adjustment of the Khazir River to the style of structural deformation using remote sensing data" Iraqi Geological Journal Special issue proceeding of the 10th Iraqi Geological Congress , Vol. 25 , No.1 , pp. 65-81.
3. Salih,M.R.and Al-Daghastani, H.S. (1993): Thrust Mechanisms and their relationship with folding and geomorphology of Bashiqa Structure,north of Iraq,J. Geo.soc.of Iraq,V.26.No2.
4. Burwary,A.M. (1983): Report On the regional geological survey of the Khazir-Gomel area ,unpublished ,som report,No.1137,Hsomlibrary,Baghdad.
5. AL-Omari,F.S.and Sadak, A.(1973):Geological studies of Gebel Maqlub area Northen Iraq,J.of the Iraq V1.pp62-82.
6. Buday,T. (1980): The Regional of Iraq Stratigraphy and Paleogeograph" Dar AL-Kutib Published Mosul, pp.432.
7. Al-Daghastani, H. S. Y. (1994):Impact of the structural Deformations on the Drainage system of Bashiqa Structure. Iraqi Sc. For Water Resources. No. 2. Vol. 13 .
8. Hey,R.D.(1988): Mathematical Models of channel morphology,in modeling Gomorphology systems, and Mg(ed).Johnwiley chichester,pp.99-125.
9. Snow,R.S,and Slingerland,R.L.(1987): Mathematical modeling of graded River profiles,J. Geo. Uni. Chicago, ol.95,pp15-33.
10. Eelby.M.J.(1985):Earth's changing surface, an introductionto geomorphology, Claendon Press, Oxford.

تحليل مظهر المقطع الطولي لوادي دولوج في محافظة نينوى باستخدام (GPS)

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الملخص:

أتاحت تقنية GPSٍ الواحد من اهم التقنيات الحصول على معلومات دقيقةعن المقطع الطولي لأي نهر او وادي، اذ تم استخدام هذه التقنية في اجراء تحليل مظهر للمقطع الطولي لوادي دولوج من المنبع الى المصب الواقع في محافظة نينوى، والذي يمثل احد روافد نهر الخازر ،وقد اسفرت الدراسة من خلال اسقاط نقاط الارتفاعات وحساب المسافات من المنبع الى المصب في برنامج (Excel)عن وجود اربعة نقاط تجديد تمثلت في(٦٩٢-٥٧٤-٤٦٢-٣٠٨م)وعكست منسوب الوادي في نقاط ٦٩٢ و ٥٧٤و ٣٦٢م والتباين في مستوى قاعدته عند نقطةالتجديد ٣٠٨م. كما وتبين تكيف الوادي لتاثير البنية الجيولوجية من خلال الالتواء.