

MAKING A COMPARATIVE WAY BETWEEN THE DEVELOPMENT IN PRODUCING DIGITAL MAP AND HARD COPY MAP⁺

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Abstract :

This research depends on the comparing the development between digital map and hard copy map for the same region after passing period of time. The work was done with a high accuracy corrected satellite photo taken (Quick Bird) with (0.6 m) resolution for 2003, and also used hard copy map for the same city (Mosul city) for 2000 which lie between 44 longitude and 36 latitude. And in this research will update hard copy map from satellite image and then find the new features such as buildings, roads,.....etc. That is happened on this area after the period of time and finally compare between hard copy map and digital map, by knowing the changes.
Keywords (GIS, Digital map, ERDAS 8.4, Quick Bird)

مقارنة التحديث الحاصل بين الخارطة الرقمية والخارطة التقليدية

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المستخلص:

يعتمد هذا البحث على مقارنة التحديث الحاصل بين الخارطة الرقمية والخارطة التقليدية لنفس المنطقة بعد مرور فترة زمنية معينة وذلك للوصول الى الافضل من ناحية ما توفره هذه الخرائط من بيانات من حيث السرعة للرجوع اليها وعدم الحاجة الى الذهاب الى الموقع لمعرفة البيانات او العوارض المطلوبة. أعتد البحث على صورة فضائية مصححة مأخوذة من قمر (Quick Bird) بدقة (0.6 m) لسنة 2003 ، وكذلك استعمال خارطة تقليدية لنفس المنطقة (منطقة الموصل) لسنة 2000 حيث تقع مدينة الموصل بين 44 خط طول و 36 خط عرض .
تم في هذا البحث تحديث الخارطة التقليدية من الخارطة الرقمية وبعد ذلك ايجاد العوارض الجديدة مثل البنايات والطرق وغيرها التي وجدت بعد مرور فترة زمنية معينة في تلك المنطقة ، واخيراً اجراء مقارنة بين الخارطة الرقمية والخارطة التقليدية ومعرفة التغيرات الحاصلة عليها .

Introduction :

Society has for many years demanded more information about the earth and its surface. It has been the task of mapping to meet these requests. The demand for update and complete topographical information in various forms is increasing rapidly to develop natural resources.

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Development and extension of cities have a high requirement for maps that contain the most recent information. Thus, the need to produce update maps is increasing rapidly to meet these requirements.

The past three decades have been seen rapid development in digital map and geographic information system (GIS). so that many problems can be solved in a timely manner with the aid of these techniques that consider a few years back too tedious and time consuming. This technique allow efficient, economical and quick map production and revision. Thus, digital mapping is replacing the graphic manuscript with digital file and graphical data base with a topographical digital data base. It has been facilities map production and revision containing various item.

Digital map is an organized network of cartographic information stored on the computer read and be represented in the image of the map. It is required the possibility of storage, and vast a1960 to 1980 until it reaches this level of capability to take quick decisions [1]. In this study the purpose of this research to compare the development between the digital map and hard copy map, and know which one of them can be developed after a period of time by assigning the changes [2].

Digital map :

It is considered a very important part for GIS (Geographic Information System) and it could be updated, added and modifying all the features appearing on the map .The digital map is the final result from using GIS and its almost produced from the satellite or aerial [3]. Thus the work steps of digital map are :

- 1- Data collection.
- 2- Data processing as required.
- 3- The data viewing.

Increasingly, computer methods are being used in mapping and related fields [4]. Computers are being applied to the processing and analysis of remote sensing data, to the production of maps (called computer – assisted cartography), and to the operation of geographic information system [5].

Computer techniques can introduce a number of potential advantages, including speedier, easier and more accurate map design and production .Other manipulation, including scale and projection change and the statistical analysis of data, can also be more easily accomplished using computer techniques [6].

Geographic Information System (GIS) :

Is a system for getting the best required results with high accuracy of details for that its used in many applications (health, navigation, digital maps, producing data managements, and finding the best positions), this system depends on many kinds of data, and finally this system formed from software, huge sum of data and tools that are used in map producing or data analysis [7].

Thus a GIS acts a link between the real world and the user. The real world is the source of the information stored in the system. The user employs the GIS to analyze the information and applies the results to the solution of a problem [5]. The essential considerations in any GIS, from the stand point of such a user, are data input and storage structure, manipulation and analysis techniques and output capabilities [8].

Objective

The main objective of this research is to study the application of remote sensing and GIS techniques to produce and revise digital map of Mosul city northern Iraq. Satellite image (Quick Bird) with 0.6 m resolution taken at 2003 and hard copy map of the city are used in this study.

The practical Parts

The practical parts done with the following steps, the first step, corrected the map from satellite image by using (ERDAS 8.4) software on UTM Clarck 1880 as shown in fig (1) , fig(2) represented the output of the corrected map on Clarck 1880. Then corrected the map by (ERDAS 8.4) software on UTM WGS 1984 as shown in fig (3), fig(4) represented the output of the corrected map by (ERDAS 8.4) software on UTM UTM WGS 1984, the third steps subset part from map as the same region of satellite image . as shown in fig (5), after that conform the map on the satellite image to show the different features which may be appear in a map or satellite image as shown in fig (6), and create new features from satellite image on map which appear in satellite and not appear on map (new residential) as shown in fig (7), finally compare the updating between the hardcopy map and digital map that resultant from hard copy map for the same city, as shown in fig (8) and the table (1).

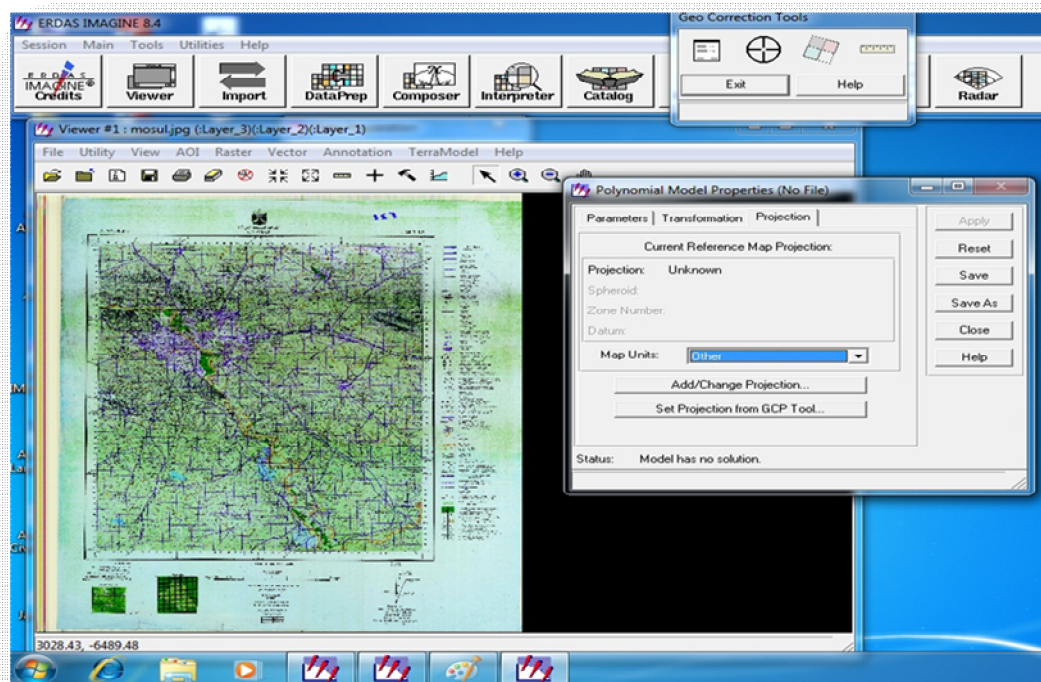


Fig (1) Correct the map by (ERDAS 8.4) software on UTM CLARC 1880.

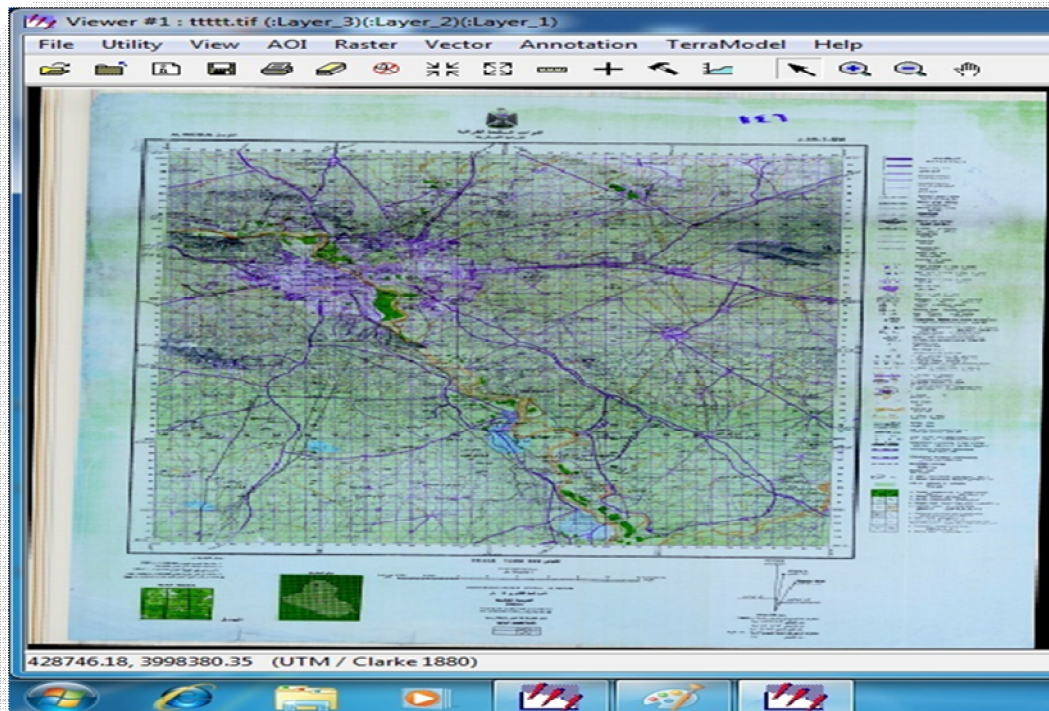


Fig (2) The result map on Clarck 1880.

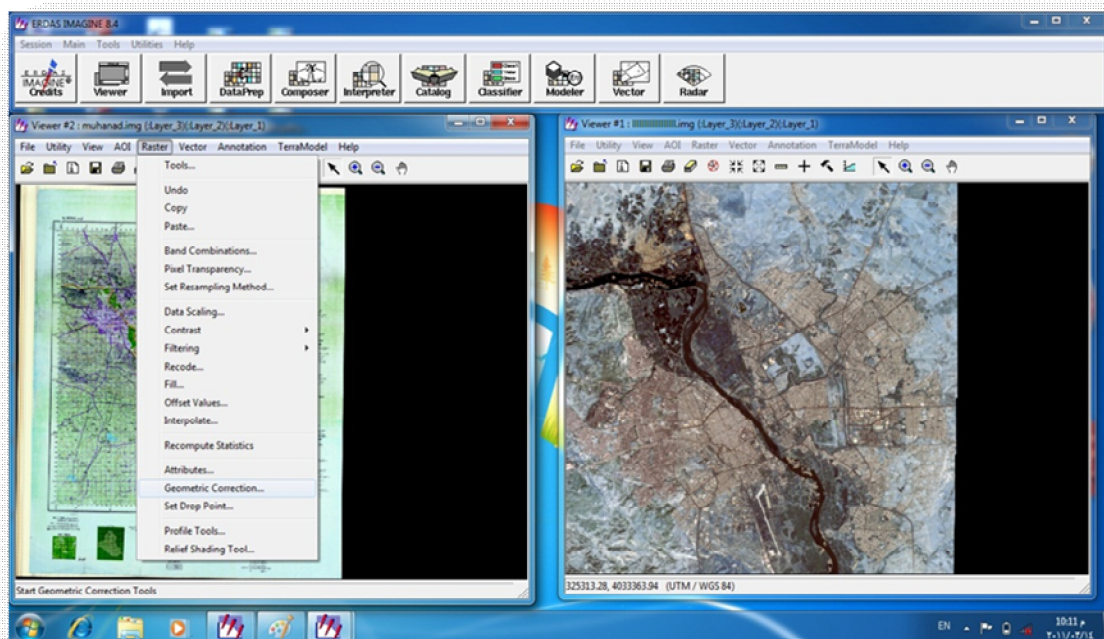


Fig (3) Correct the map from satellite image by (ERDAS 8.4) software on UTM WGS 1984.

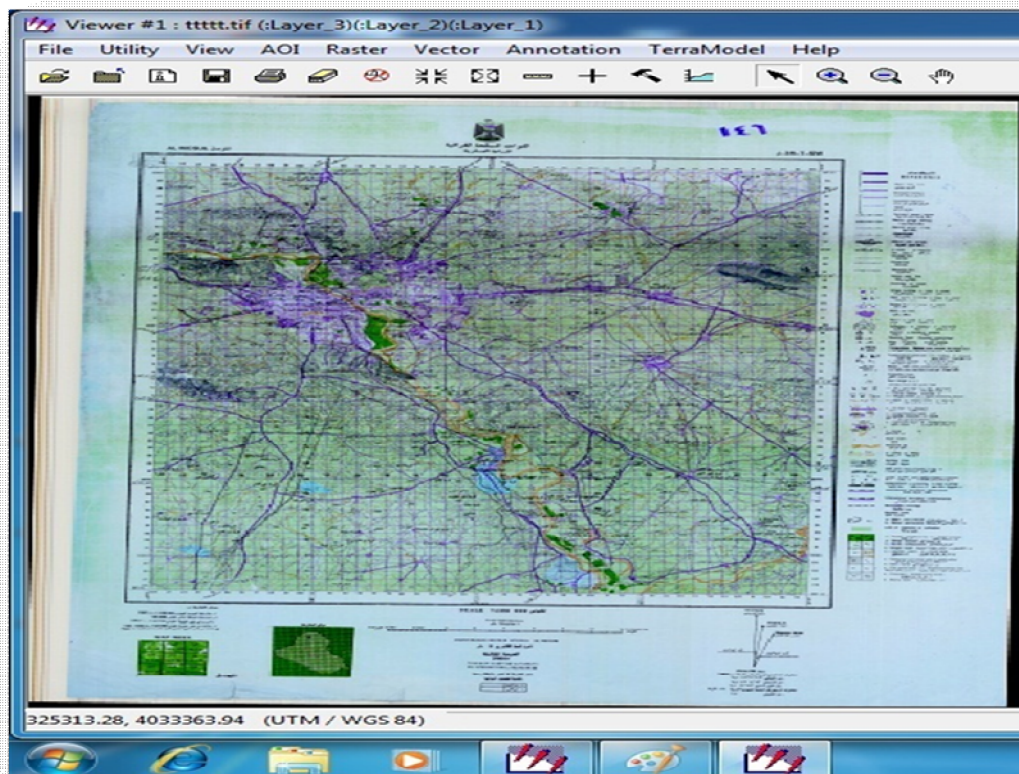


Fig (4) the result map on UTM WGS84.

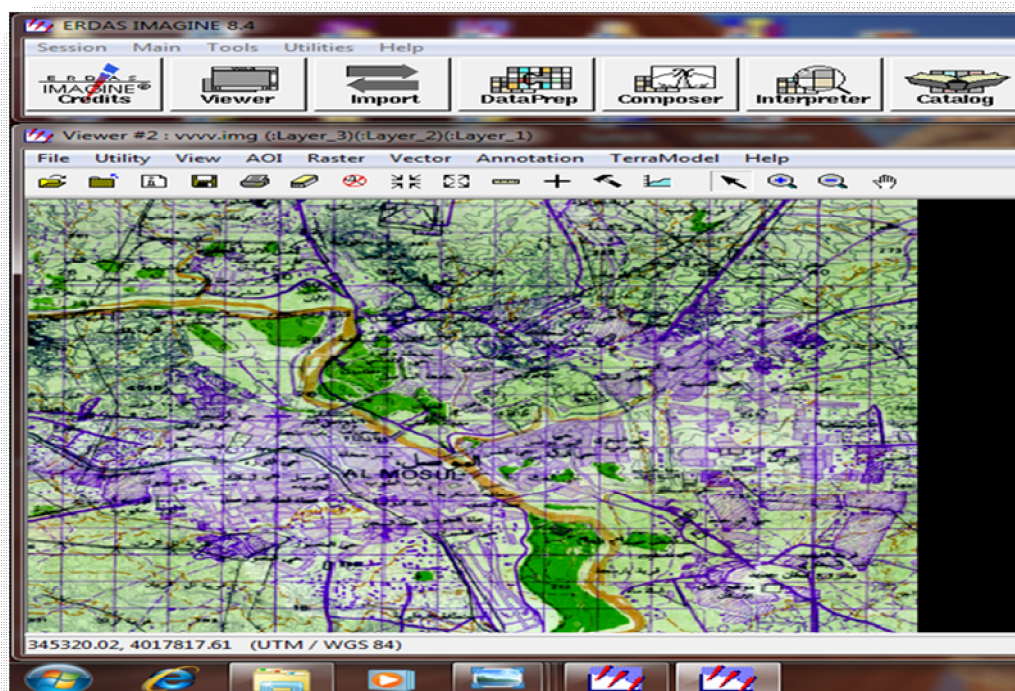
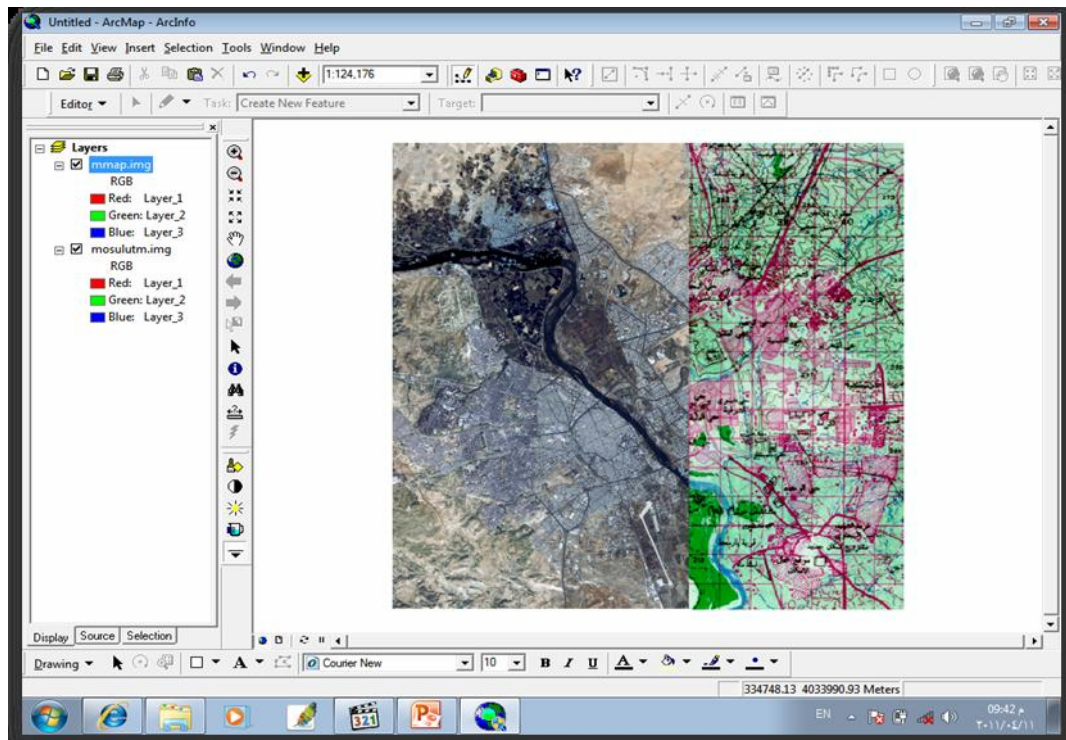
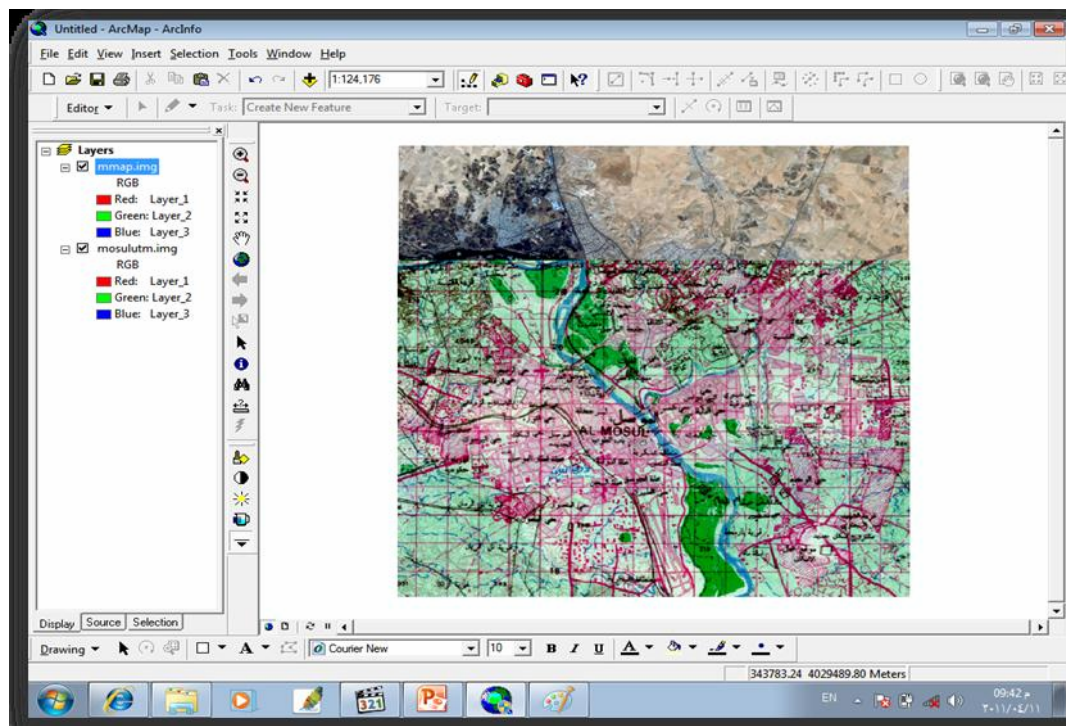


Fig (5) the Subset part.



(a) Left



(b) Top

Fig (6) Conform the map on the satellite image.

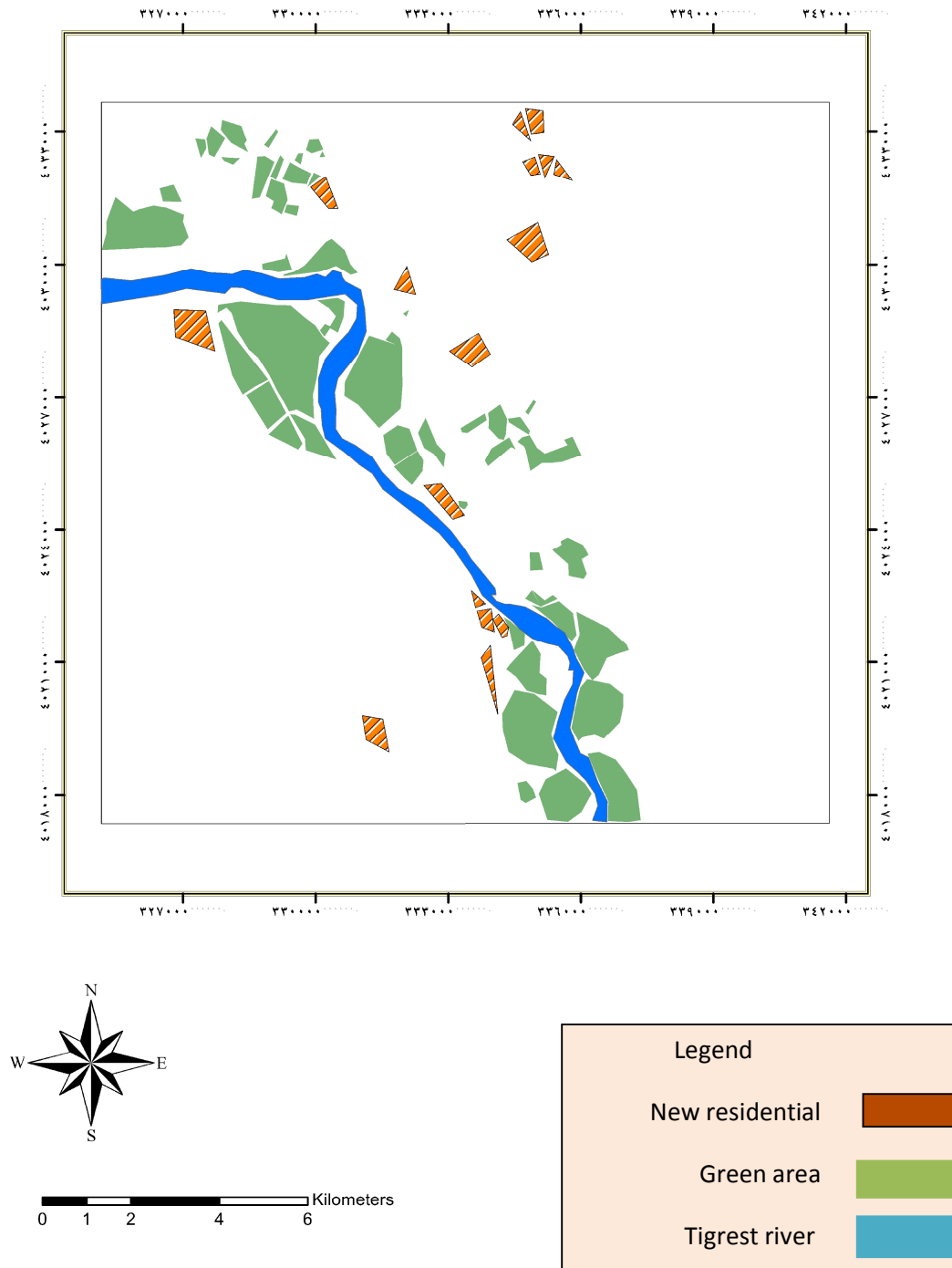


Fig (7) Create the new features as layer

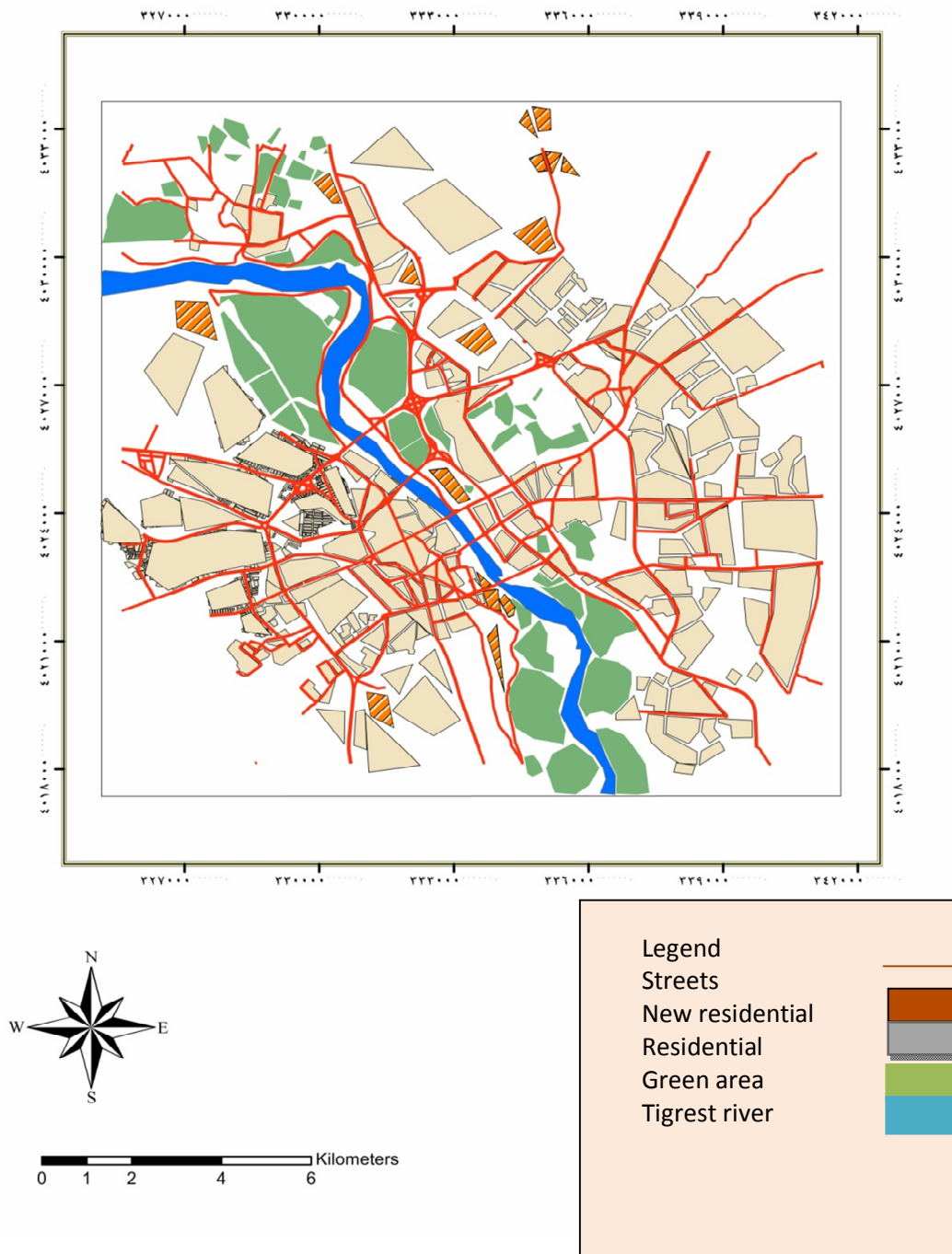
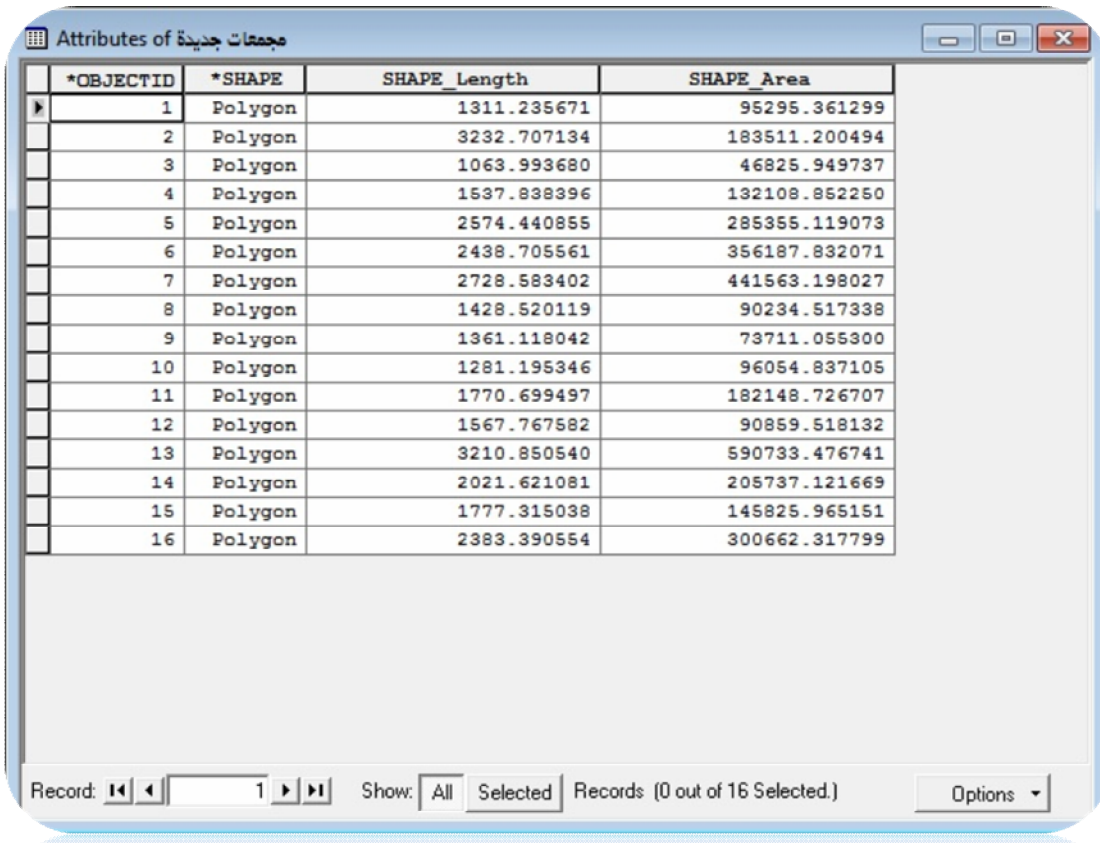


Fig (8) the output map (MOSUL City center)

Table (1) Data which used to create features as layer



*OBJECTID	*SHAPE	SHAPE_Length	SHAPE_Area
1	Polygon	1311.235671	95295.361299
2	Polygon	3232.707134	183511.200494
3	Polygon	1063.993680	46825.949737
4	Polygon	1537.838396	132108.852250
5	Polygon	2574.440855	285355.119073
6	Polygon	2438.705561	356187.832071
7	Polygon	2728.583402	441563.198027
8	Polygon	1428.520119	90234.517338
9	Polygon	1361.118042	73711.055300
10	Polygon	1281.195346	96054.837105
11	Polygon	1770.699497	182148.726707
12	Polygon	1567.767582	90859.518132
13	Polygon	3210.850540	590733.476741
14	Polygon	2021.621081	205737.121669
15	Polygon	1777.315038	145825.965151
16	Polygon	2383.390554	300662.317799

Discussion :

The results indicated the capability of representing the new features in the digital map inverting at the hard copy map, so we cannot draw such these feature because of the limitation of getting this procedure after accomplished such a map as a hard copy but this can be done easily with digital format because it is stored on a computer and by using a unique software that enable the users from drawing these features and added them to the old map as a layer or on the same map even after a period of time.

This process offers for us the time, the effort and the cost. In the beginning the time was offered, so in the case of using digital format the new features can be drawn indirectly case but in the case of using hardcopy this require redrawing to an able us appearing every new feature if this process was demanded when the work require that there is map to be covered all the existing features at the region inner the new ones that not exist in the old map, so in this research can be add the phenomena at a short time.

In the other hard the effort that requires an attempting of drawing anew map, leaving to the work site and observe, cover all the features by surveying team .This can be done by offering a big effort and more time from the normal for a survey work.

When we talk about the cost its more expensive by preparing the staff that involves in this case such as the updating of a maps moreover the time that influence on the cost, so when the time is over, the cost will be more than the normal depending upon the days .

Conclusion :

- 1- The development is consider very essential in the surveying works for offering many aspects , information in detail and up to date that can be return to it at any time for obtaining a data with high accuracy.
- 2- Difficulty the updating data for a hard copy maps so we deal with the digital map for an easy understanding in the existing time or after a period of time.
- 3- The update can be done for any region or any time easily.
- 4- It is easily to know the update features from the map without return to the study Area, which less the cost in an engineering project.
- 5- Know from the features the building and green area or any object which wanted For studying.
- 6- It is the important part to the engineering for offering in the works which make the development more easily in the future.

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