
GORS AND ITS ACTIVITIES IN SYRIA

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ABSTRACT

The General Organization of Remote Sensing (GORS) in Syria was established in 1986, it was assigned to carry out scientific studies and researches related to remote sensing applications, such as geology, hydrology, agriculture, environment and other related domains. Also to disseminate technology and other knowledge of remote sensing to other national institutions and promote the peaceful use of outer space. For the abovesaid reasons, GORS since its inception carries out activities in the field of remote sensing applications and technology transfer.

INTRODUCTION:

The General organization of Remote Sensing was constituted in Syria, in February 1986 in accordance with the Legislative Decree No. /8/. It has thus replaced the National Remote Sensing Center which was established in the Syrian Arab Republic, through an ad hoc Steering Committee in 1981. The Organization is located in Sabbora area (about 17 Km West of Damascus). The Organization's total area is 250 000 m², including the main building, the student dormitory, the guest house and the recreation area.



Figure1. Buildings of GORS.

1. COOPERATION**1.1 Internal Cooperation**

GORS cooperates with the following governmental bodies:

- Ministry of Irrigation.
- Ministry of Agriculture.
- Ministry of Petroleum.
- Ministry of Housing and Public Utilities.
- Ministry of Higher Education.
- General Establishment of Surveying.

- General Directorate of Meteorology.
- Universities.

GORS has carried out many mutual projects and studies in cooperation with that bodies in Syria.

1.2 External Cooperation

1.2.1 Arab Countries

GORS cooperates with all Arab countries and the Arab league. GORS has cooperated with Arab League Educational Cultural and Scientific Organization in holding the First Arab Conference on Space Research , GIS and Survey Sciences in Damascus during 29 Oct. – 2 Nov. 1995. The Second Arab Conference on Remote Sensing and Space Sciences in Cairo during 2 – 5 Dec. 1997. GORS is seeking to establish an Arab Space Agency.

1.2.2 Foreign Countries

GORS cooperates with the following foreign countries and international bodies: Germany, France, Austria, Italy, England, Poland, The Netherlands, Cyprus, USA, Canada, Russia, Japan, Pakistan, Turkey, India, ISPRS and the United Nations.

2. TRAINING

GORS conducts an internal training course for its new technical staffmembers once a year, and many courses on some softwares. GORS has organized the following Symposia:

- The First Regional Symposium on Role of Remote Sensing in Supporting the Economic of Development Countries, 5 – 7 March 1990.
- The Second Regional Symposium on Remote Sensing as a Tool for Natural Resource Management, 9 – 12 December 1991.
- The Third Regional Symposium on Integration of Remote Sensing and Geographic Information Systems, 23 – 26 November 1992.
- The Fourth International Symposium on Applications of Remote Sensing for Desertification Monitoring and Control, 16 – 19 December 1993.
- The Fifth International Symposium on Applications of Remote Sensing and GIS in Water Resources Management, 31 October – 3 November 1994.
- The Sixth International Symposium on Role of Remote Sensing and the New Systems in Supporting the Integrated Development, 29 October – 2 November 1995.
- The Seventh International Symposium on Applications of Remote Sensing and Assisting Systems to Comprehensive Environmental Planning and Archaeological Detection, 25 – 28 November 1996.
- The Eighth International Symposium on Applications of Remote Sensing to Land Use and its Environmental Impact, 1 – 4 December 1997.
- The Ninth International Symposium on Space Sciences, Informatic and Globalization, 30 November – 3 December 1998.
- The Tenth International Symposium on Remote Sensing Integrated Systems: Satellites, Receiving Stations and Applications, 20 23 November 1999.

GORS participates with internal and external conferences, symposia, training courses and workshops.

3. SYRIAN-SOVIET JOINT SPACE FLIGHT:

GORS has taken part in the Syrian-Soviet Joint Space Flight in 1987. Within the framework of the technical and scientific cooperation between Syria and the Soviet Union, The Soviet Union has agreed on training of two Syrian pilots Mr. Mohamad Fares and Mr. Munir Habib for that flight. Therefore we have prepared the following scientific experiments to be carried on MIR station:

- A- Space medicine: includes the heard planning, blood circle, sport, mechanisms of adaptation, changes in muscle mass, balance of the body and vision difference.
- B- Space metallurgy: includes the semiconductors, new metal mixture and new crystals.
- C- Earth's atmosphere: includes the atmosphere dynamics and solar radiation.

D- Earth resources monitoring: includes applications of remote sensing to agriculture, geology, hydrology, hydrogeology and environment in Syria using two cameras MKF-6M and KATE-140. On 22 July 1987, the Soviet Union launched Soyus T.M.3 with crew Mr. Alexander Vectorinco, Mr. Alexander Alexandrov and Mr. Mohamad Fares, they jointed Mir station till 30 July 1987. We had good results from the abovementioned experiments for humanity and environmental protection.

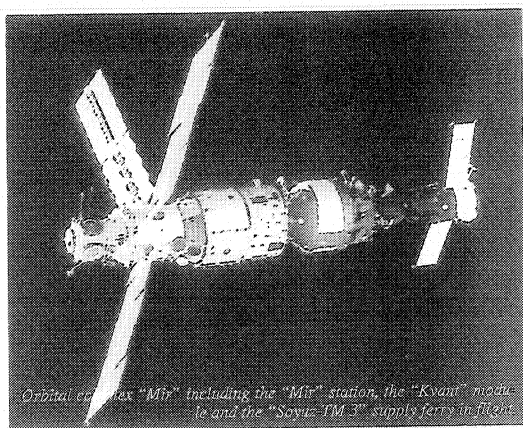


Figure 2. MIR Station



Figure 3 . Syrian- Soviet Crew.

4. PUBLICATIONS

GORS has issued the following publications :

- Space Atlas of Syria.
- Atlas of Commercial Fishes in the Syrian Coast.
- Glossary of Remote Sensing Terminology.
- Journals of Remote Sensing.
- Space Map of Damascus in scale 1/50 000 and 1/25 000.
- Space mosaic of Syria in scale 1/750 000.

GORS is the distributor of Landsat, SPOT and Radarsat data in Syria.



Figure 4. publications of GORS

5. PROJECTS AND STUDIES

GORS carries out several studies and projects on remote sensing applications to meteorology, cartography, geology, hydrology, hydrogeology, agriculture, urban planning, environment and archaeology in Syria as follow:

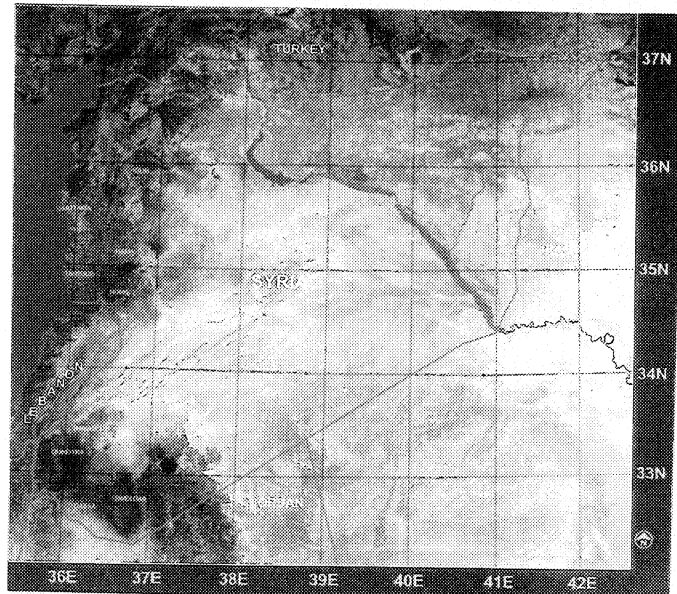


Figure 5. Space Mosaic of Syria.

5.1 METEOROLOGY:

WMO has developed a policy and practice for the international exchange of meteorological data and products. The new policy included the free and unrestricted exchanged of meteorological data essential for meteorological and hydrological services and for climate change.

GORS has a meteorological receiving station. We can receive and analyze meteorological data for weather forecasting in Syria.

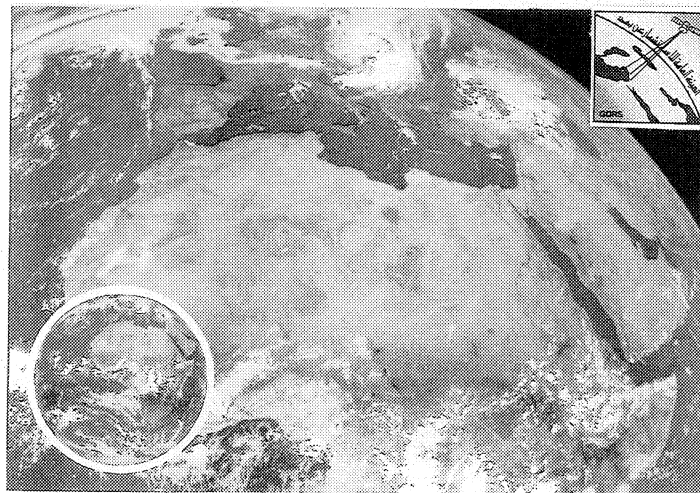


Figure 6. Meteosat Image for Middle East Taken by the Receiving Station at GORS.

5.2 CARTOGRAPHY:

Remote sensing is useful in correcting and updating world topographic maps at different scales. With more that half of developing world not yet mapped at scale 1/1000 000, provides data to map uncharted areas quickly and cheaply.

GORS tries to have the facilities for updating the Syrian topographic maps till scale of 1/50 000 by using SPOT and Cosmos satellites, in addition to making digital maps for Syria.

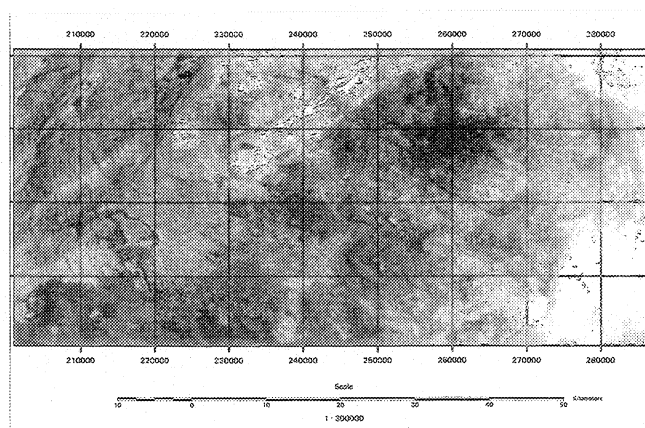


Figure 7. Digital Map of Damascus Area.

5.3 GEOLOGIC SURVEY, MINERAL AND PETROLEUM EXPLORATION:

Remote sensing contributes to improve geologic mapping in the United States and enables developing countries to produce geologic maps for some area for the first time. Unique capability to disclose large geologic anomalies which indicate possibility of mineralization. Save costs by directing attention to areas where further exploration by air or on the ground may be rewarded.

GORS is carrying out some projects on updating the geological and mineralogical maps in Syria.

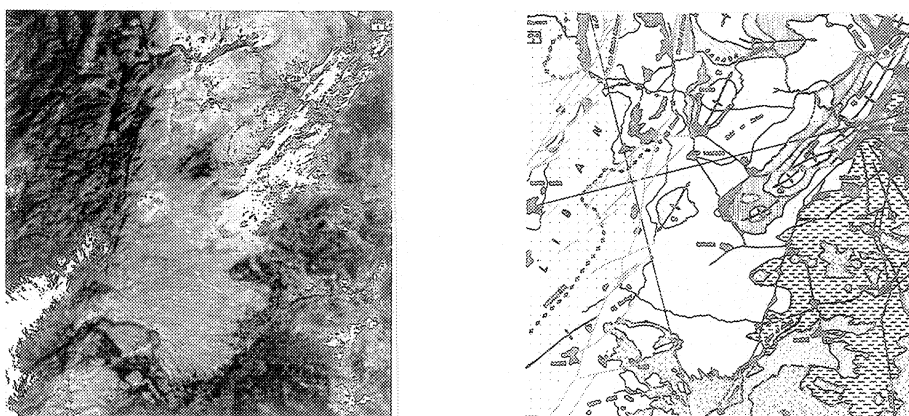


Figure 8. SPOT Image for Damascus Area with its Geological Map.

5.4 HYDROLOGY:

Remote sensing is highly reliable in locating and monitoring surface water. Useful in assessing major watershed characteristics that effect runoff.

GORS is carrying out some projects on monitoring large and small lakes in Syria. In addition to monitor the snow on Haramoun Mountain in south –West of Syria.

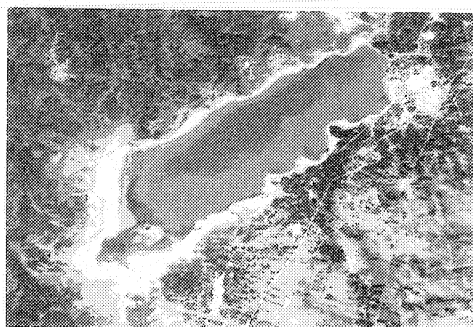


Figure 9. SPOT Image for Qattina Lake.

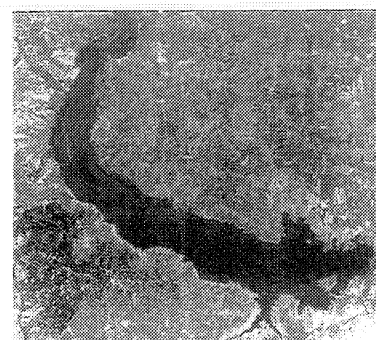


Figure 10. Landsat Image for Al-Assad Lake.

5. 5 HYDROGEOLOGY:

Remote Sensing identifies geologic features that indicate promising area for groundwater exploration. GORS is carrying out projects on exploration of groundwater by using Landsat, SPOT and ERS data in cooperation with FAO.

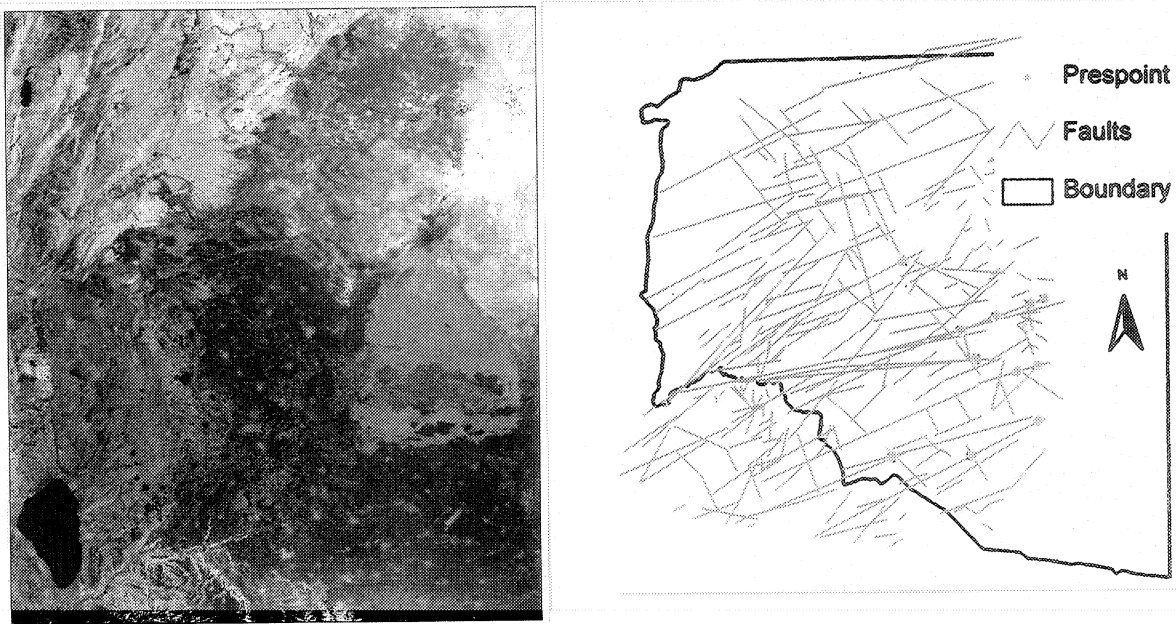


Figure 11. Landsat Image for South Part of Syria with its Interpretation.

GORS has carried out a thermal infrared survey along Syrian and Lebanese coast for location submarine outflows with discharge of 500-1000 million m3.

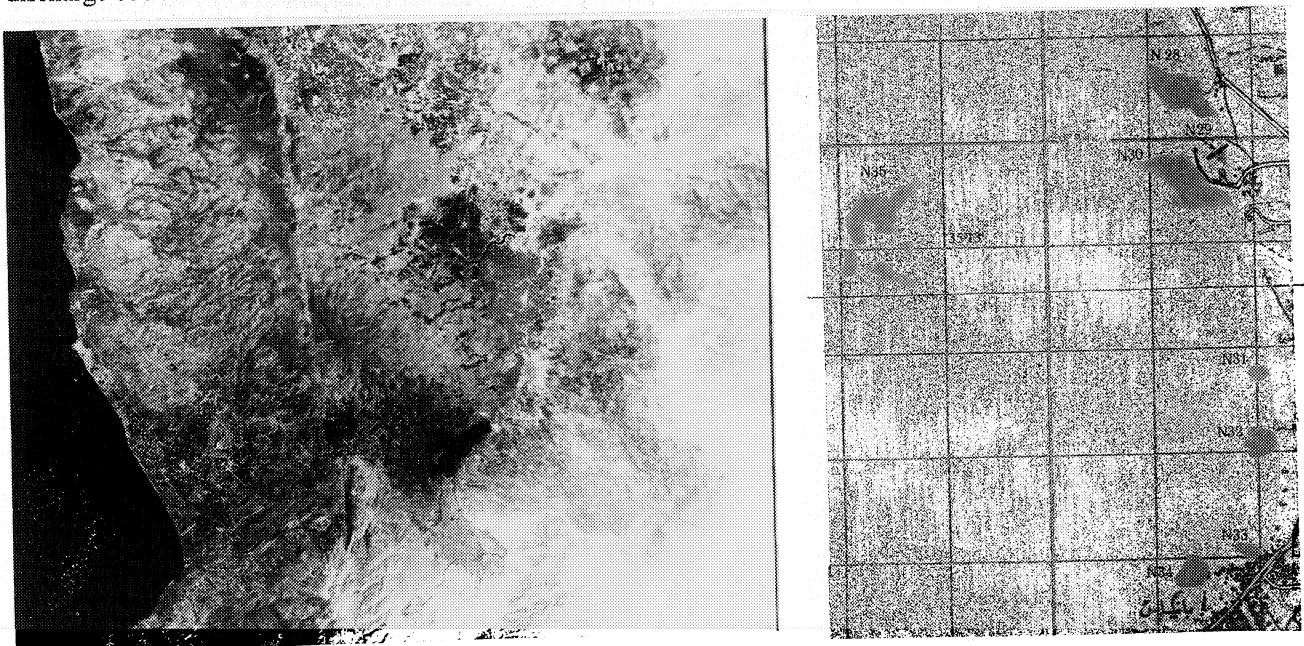


Figure 12. Landsat Image for Syrian Coast with Thermal Infrared Survey.

5. 6 AGRICULTURE:

Remote sensing can provide useful inventory data for vegetation types. Monitoring of significant vegetational changes. GORS is carrying out some projects on land use/land cover mapping, crop monitoring, soil classification, erosion and degradation, desertification and reforestation.

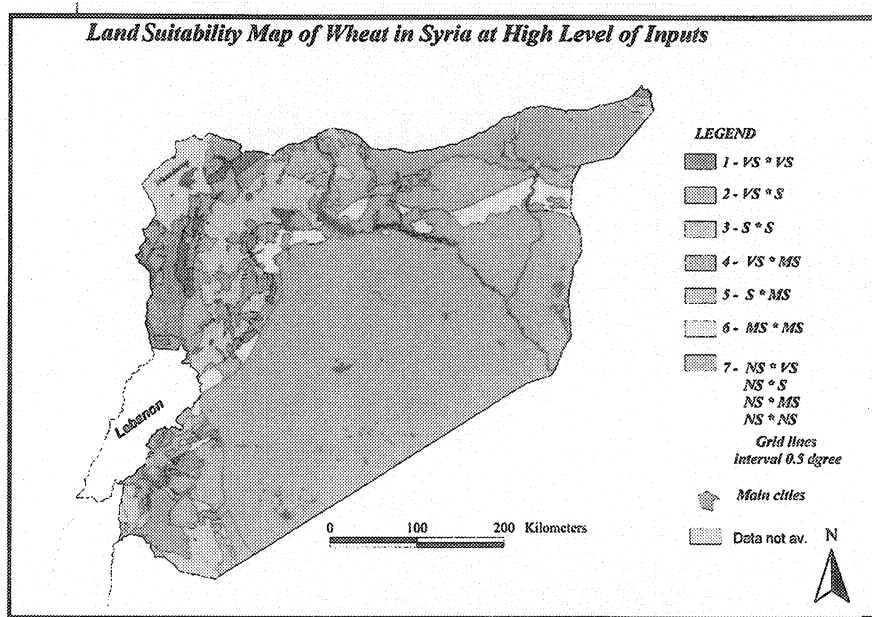


Figure 13. Land Suitability Map of Wheat in Syria at High Level of Inputs.

5. 7 URBAN PLANNING:

Remote sensing and GIS is widely used in urban planning. GORS is carrying out some projects on urban planning mapping for Damascus and Aleppo areas.

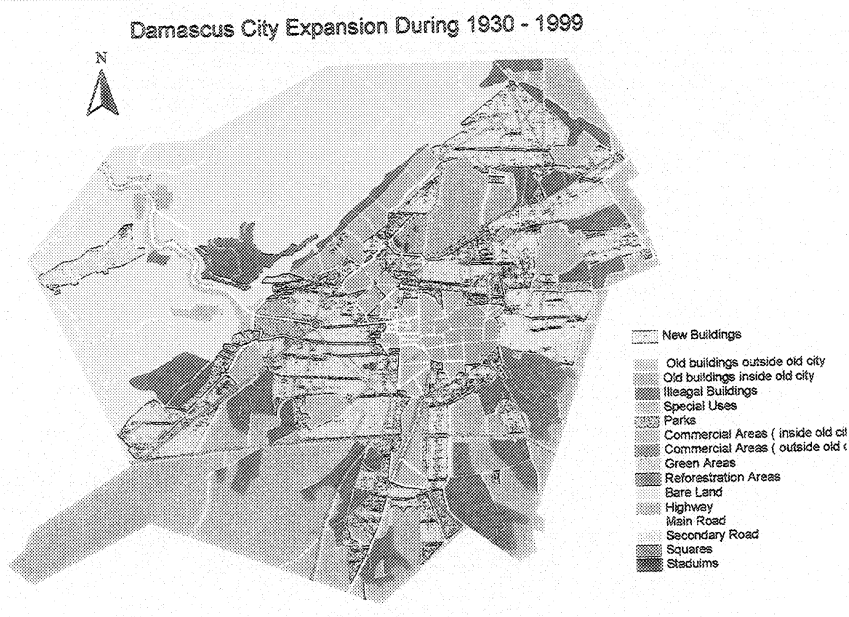


Figure 14. Damascus City Expansion During 1930 - 1999.

5. 8 ENVIRONMENT:

The unique capabilities of remote sensing satellite for providing comprehensive, synoptic and multi-temporal coverage of large areas at regular intervals has been and would be an indispensable tool for continuous environmental monitoring in lowest lines, floods, storm damage, volcanic eruption, oil slicks in the sea etc.

GORS is carrying out projects on environmental monitoring for example Baniyas and Tartous areas.



Figure 15. Air pollution in Tartous Port.

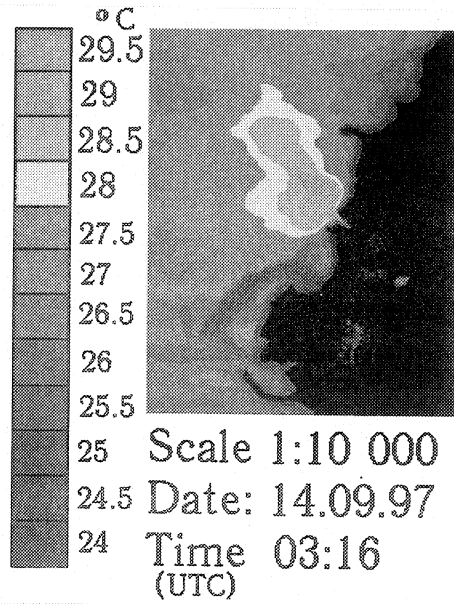


Figure 16. Water Pollution in Baniyas Coast.

5.9 ARCHAEOLOGY:

Remote sensing is an important tool in exploration of historical sites. GORS has carried out a project on Exploration of archaeological sites in Palmyra area in cooperation with UNESCO and Torino Institute for Archaeology in Italy.



Figure 17. Landsat Image for Palmyra Area with its Archaeological sites.