

**Using landsat records to detect structures in the ruins of Samarra city - Iraq**

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**A B S T R A C T**

**The ancient city of Samarra represents a distinguished architectural stage in the Abbasid period. Located on the bank of the Tigris River, Samarra was the capital of the Abbasid Caliphate for 58 years (836–892 A.D.) For reasons yet unknown, the city was suddenly abandoned at year 892 A.D., In recent years, everexpanding urban and agricultural areas have threatened to encroach upon the old city owing to its unclear boundaries. Consequently, in 2007, the United Nations Educational, Scientific and Cultural Organization added Samarra to the list of World Heritage sites in danger. It is estimated that approximately 80% of the city remains unexcavated. The aim of this study was to differentiate between ancient and modern settlements in Samarra using remote sensing methods in order to map the ancient sites. To distinguish the buried structures of the ancient city, Landsat satellite images were enhanced (i.e., change detection and edge analysis) using image processing software. The findings point to the existence of structures that are invisible on the ground surface. These features correspond with irrigation channel systems and other structures found in old maps of Samarra. Human activity threatens to have adverse effects on the ancient city. Determining the boundaries of Samarra will facilitate the development and implementation of protective policies and regulations for this important archeological site**

**Keywords: Buried object detection; High-pass filters; Image edge analysis;  
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